Santa Clara Valley Water District SM

PLANNING STUDY REPORT

Cunningham Flood Detention Facility Certification Project

Project No. 40264011

WATERSHEDS DESIGN AND CONSTRUCTION DIVISION

December 2015

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SANTA CLARA VALLEY WATER DISTRICT

CUNNINGHAM FLOOD DETENTION FACILITY

CERTIFICATION PROJECT

Project No. 40264011

PLANNING STUDY REPORT

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December 2015

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CUNNINGHAM FLOOD DETENTION FACILITY CERTIFICATION

Project No.: 40264011

PLANNING STUDY REPORT

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CHAPTER 1. INTRODUCTION

1.1 Report Purpose

This report is a Planning Study Report (PSR) for the Capital Watersheds Design and Construction Division's Cunningham Flood Detention Facility Certification Capital Improvement Project. This report is intended to be circulated for District-wide review as required under District QMS procedure W73002 – Planning Phase WBS Description and Instructions.

The District is conducting a planning study on the Cunningham Flood Detention Facility to determine if the flood detention facility is operating as intended and whether in its existing condition it can be certified by the Federal Emergency Management Agency (FEMA). The PSR presents and summarizes the project's background, objectives, problem definition, and the studies and evaluations performed to develop and assess various project alternatives to identify a staff-recommended alternative for meeting the project objectives.

1.2 Project Background

The Cunningham Flood Detention Facility is situated in the District's East Zone within Lake Cunningham Regional Park (LCRP or park), a 202-acre water-oriented park located in the southeast section of San Jose. It is bounded by Capitol Expressway to the west, Cunningham Avenue to the north, White Road to the east, and Tully Road to the south and is just upstream of the District's Lower Silver Creek Flood Protection Project (LSC Project). The park was designed and constructed in accordance with a LCRP Master Plan originally developed in 1976 by the City of San Jose (City) to function dually as a recreational and flood detention facility. Lower Silver, Flint, and Ruby Creeks flow along the perimeter of the park. A map of LCRP is shown in Figure 1-1.

In 1978, the District entered into a Joint Use Agreement (1978 Agreement) with the City to develop a joint recreational-flood detention facility at the LCRP site (see Appendix A for the 1978 Agreement). Per the 1978 Agreement, the City holds fee title to all the park lands and is responsible for the park's recreational-related facilities including Lake Cunningham. The City granted the District an easement to all park lands and the District is responsible for the flood improvement measures in LCRP which include the creeks, creek levees, and overflow weirs. The easement, recorded in October of 1980, includes language that allows for the District to take measures necessary for flood protection purposes provided the measures are compatible with the park uses (see Appendix A for the easement).

The City was the lead agency responsible for the design and construction of the improvements in the late 1970s and early 1980s and the District assisted by providing design input and funds towards the construction of the park. The flood detention facility was planned to provide temporary storage of floodwaters from Lower Silver Creek, Flint Creek, and Ruby Creek in the park and the City was not to hold the District responsible for any damages caused by the planned inundation.



Figure 1-1. Lake Cunningham Regional Park Site Map and FEMA 1% Floodplain

1.3 Project Objectives

This planning study is being conducted to determine the existing flood detention facility's floodwater storage capacity to ensure that the flow released into Lower Silver Creek downstream (north) of Cunningham Avenue can be safely conveyed with adequate freeboard. The planning study is to identify any necessary flood improvement measures to ensure the LSC Project's design flow parameters are met. The planning study is to also identify any necessary flood improvement measures to ensure the flood detention facility can be certified with FEMA.

Once improvements for both the Cunningham Flood Detention Facility and LSC Project are complete, a Letter of Map Revision (LOMR) will be prepared and submitted to FEMA to revise the applicable flood insurance rate maps. Completion of both the Cunningham Flood Detention Facility and LSC Project improvements will provide 1-percent flood protection to more than 3,200 homes, businesses and schools in the Lower Silver Creek 1-percent floodplain near and north of LCRP.

The following are the project objectives:

1. Ensure the flood detention facility does function as agreed upon by the City and the District in 1978 – to be a joint recreational and flood detention facility. Update, if necessary, the 1978 Joint Use Agreement between the City and the District to be consistent with the flood detention facility's operational condition.

2. Ensure floodwater stored in the park is commensurate with the 1978 planned floodwater surface elevation.

3. Ensure flood improvement measures are compatible with park uses.

4. Ensure the flow released from the park into Lower Silver Creek downstream of Cunningham Avenue can be safely conveyed with adequate freeboard so the LSC Project can be FEMA certified.

5. Ensure the flood detention facility can be FEMA certified.

6. Ensure the flood detention facility's Division Safety of Dams jurisdictional status remains non-jurisdictional.

1.4 Relevant Board Governance Policies

The relevant Board Ends Policies for this planning study are: Ends Policy 3.1 Natural Flood Protection: Provide natural flood protection for residents, businesses, and visitors; and Ends policy 4.2 Water Resources Stewardship: Improved quality of life in Santa Clara County through appropriate public access to trails, open space, and District facilities.

CHAPTER 2. BACKGROUND

2.1 Historical Background

According to the 2006 San Francisco Estuary Institute report, LCRP is located in what was historically a freshwater marsh known as Laguna Socayre. Drainage was blocked by an old natural levee of Coyote Creek and the laguna served as a hydrologic resting point for Lower Silver, Ruby, Flint, and Thompson Creeks.

One of the earliest hydromodifications in the area occurred in the early 1950's when Lower Silver Creek was placed in a defined man-made channel for agricultural purposes. Although the agricultural lands were quickly converting to residential uses in the 1950's, the LCRP site, in the 1960's, was still a marshy lowland in the summer time which supported grazing livestock for a small dairy. Winter rains brought flooding to the agricultural fields and surrounding streets. Flint and Ruby Creeks did not have defined channels and would generate sheet flow across the area that eventually entered Lower Silver Creek near Cunningham Avenue. When the Lower Silver Creek channel is filled, water would spill out of the channel and inundate surrounding areas.

The District began holding public meetings in the early 1970's to develop a plan to eliminate the threat of flood damage to the area caused by the 100-year flood event. Eventually, the local community, City, and District worked together to conceive the LCRP idea. The park was envisioned to both eliminate flooding issues and increase scarce recreational opportunities for a growing population in east San Jose. The City was primarily responsible for overseeing the development of the park and retained Nolte and Associates as the primary consultant to design and construct LCRP's improvements in the late 1970's and early 1980's.

2.2 Watershed Description

LCRP is located in the Lower Silver Creek Watershed (Figure 2-1). The Lower Silver Creek Watershed encompasses an area of approximately 44 square miles and is in turn a sub-basin of the Coyote Watershed which drains most of the west-facing slope of the Diablo Range. Nearly half of Lower Silver Creek's drainage basin (including Ruby and Flint Creeks Watersheds) is tributary to the LCRP site, which drains into Lower Silver Creek downstream of Cunningham Avenue. Lower Silver Creek itself flows generally northward from Silver Creek Road at Barberry Lane to along the westerly perimeter of LCRP to Coyote Creek near US-101 freeway/McKee Road interchange.

The Lower Silver Creek Watershed is approximately five miles wide at its downstream end and slowly narrows to a width of about one mile at its upstream end. The upper portion of the watershed is located in steep foothills while the lower portion is nearly flat. The upland areas have remained relatively undeveloped (*i.e.*, rangelands to wildlife habitat) and the flatter area, about one-third of the watershed, is primarily urbanized (*i.e.*, residential and commercial uses.)

In the immediate vicinity of LCRP, single-family homes border the park to the north and the south, while a golf course (currently closed) is located to the east and the Beshoff MotorCars Dealership, Reid-Hillview Airport, and Eastridge Shopping Center are located to the west.

Recorded flooding problems within the Lower Silver Creek Watershed include runoff events in December 1889, January and March 1911, January 1952, December 1955, April 1958, January 1963, February 1983, and March 1983. During the El Niño storm of February 1998, the flow in Lower Silver Creek was at bank-full stage downstream (north) of LCRP; no overtopping was witnessed.

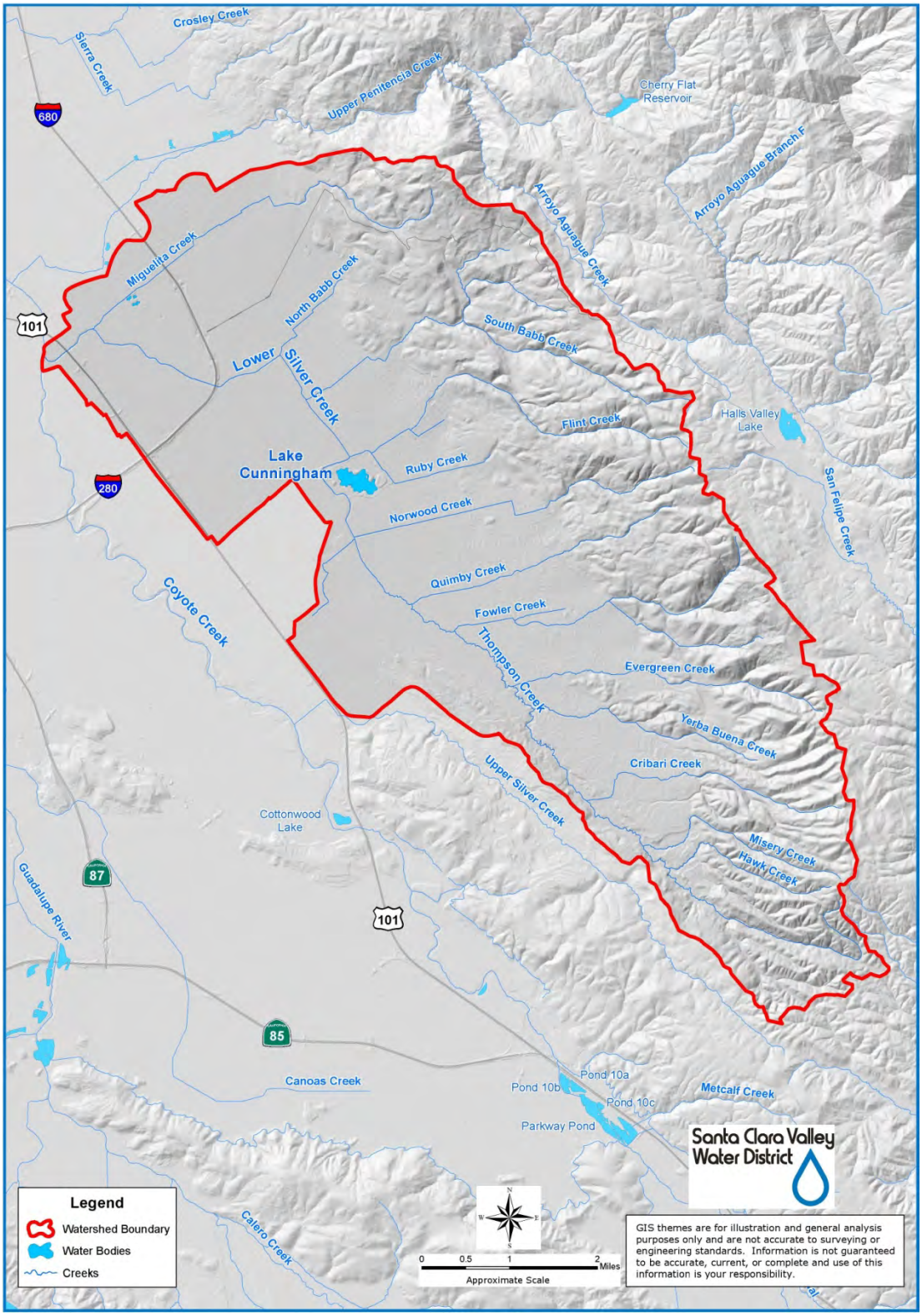


Figure 2-1. Lower Silver Creek Watershed Map

2.3 Project Area

2.3.1 City Recreational Facility

As shown in Figure 2-2, the park is a combination of aquatic, terrestrial, and recreational components. The most striking of these is the lake and area noted as the Big Meadow. The shape of the 50-acre lake was designed to be convoluted (with coves and peninsulas) to maximize the amount of linear shoreline and increase visual appeal. It is also oriented to face the prevailing northwesterly winds for the most favorable downwind sailing. The lake's water surface elevation is normally at around 124 feet NAVD88[1]. Most of the picnic areas in the park are located around the 22-acre Big Meadow, which also has an average ground surface elevation of 124 feet NAVD88. Other primary park components include the lake's marina, Raging Waters Theme Park, the skate park, picnic areas, the internal circulation system (*i.e.*, roads, parking lots, and bike and pedestrian paths), and the City's PRNS maintenance yard.

2.3.2 District Flood Detention Facility

Construction of the flood detention facility improvements consisted of re-aligning Lower Silver, Flint and Ruby Creeks to the perimeter of the park, constructing a side-channel overflow weir along Flint/Ruby Creek, and building the park roadways, Big Meadow and lake to a specific elevation to provide adequate flood storage capacity in the park. These improvements were intended to be initial flood detention facility improvements. Final flood detention facility improvements were to be constructed after improvements to Lower Silver Creek downstream (north) of the park were completed by the District.

The general operation of the flood detention facility would occur as follows:

The 1-percent flows in Lower Silver, Flint and Ruby Creeks would increase with time until the capacity of the creeks is reached. Creek flows would then overspill the creek banks relative to the interior of the park onto the park's roads and parking lots and then flow into the park's Big Meadow and lake. The floodwater level in the park would gradually rise until the water surface becomes one between the creeks and the lake. Per the 1978 Agreement, floodwater was planned to be stored in the park below a water surface elevation of approximately 132.75 feet NAVD88 (equivalent to130.00 feet NGVD29). It was estimated that the floodwater surface elevation would reach 132.75 feet NAVD88 approximately 6 hours after the 1-percent flood event peaked.

Once the 1-percent flood event peaked and the creek flows began to recede, the flow direction would reverse and the floodwater would drain from the park back to the creeks until the water level reached an elevation of approximately 129 feet NAVD88. Below 129 feet NAVD88, the majority of floodwater remaining in the park would become isolated to the lake area. The remaining floodwater in the lake area is then drained slowly to Lower Silver Creek by a 36" corrugated metal outlet pipe that connects Lake Cunningham to Lower Silver Creek near its confluence point with Flint /Ruby Creek. The 36" outlet pipe is intended to drain the water in the lake area back to the lake's normal operating elevation of 124 feet NAVD88. It was estimated that it would take approximately 6 days for the lake's water surface elevation to reach 124 feet NAVD88.

[1] North American Vertical Datum, 1988, (NAVD88)

2.3.3 Park Drainage Structures

Hydraulic structures for draining the Big Meadow and lake are located on the northern end of the park (see Figures 2-3 thru 2-5). There is a drain sump (not pictured) and outlet structure for the Big Meadow, and a pumping system for Lake Cunningham.

According to the park's operations and maintenance staff, the drain sump in the Big Meadow is quite active, pumping out accumulated groundwater from the meadow area near White Road (Corrales, 2013); it was replaced around 2010. As for the lake's pumping system, Corrales (2013) does not recall it ever being used while he has been working at LCRP for the past 23 years. It was tested once during this time, but may not have worked because the water level in the creek was too high. As a result of this, the lake's water level is not actively managed. Lake water input is due to the areas high groundwater table, surface runoff, and rainfall; lake water output is due to evaporation. It is uncertain how much groundwater affects the lake's water level.



Figure 2-2. Lake Cunningham Regional Park Map

Figure 2-3. 36" Corrugated Metal Pipe Outlet Structure for Big Meadow





Figure 2-4. Outfall for Big Meadow

Drainage into Lower Silver Creek close to Cunningham Avenue

Figure 2-5. Pump System for Lake Cunningham

Intake with invert elevation at 108.3 feet NAVD88
Outfall at Lower Silver Creek with invert elevation at 120.6 feet NAVD88

(elevation taken from 1978 plans)



2.3.4 Creeks

LCRP is bordered by three major creeks: Lower Silver Creek, Flint Creek and Ruby Creek. This section will present descriptions of these creeks.

Lower Silver Creek

Lower Silver Creek begins at Silver Creek Road and Barberry Lane where it flows in a pipe northward for approximately 6,000 feet and then transitions from a pipe to a channel at its confluence point with Thompson Creek. The Lower Silver Creek–Thompson Creek confluence point is located approximately 2,700 feet upstream of Tully Road. From Tully Road to Thompson Creek the channel is 130 to 140 feet wide, 13 to 15 feet deep, trapezoidal in shape, and heavily influenced by sediment from Thompson Creek. Norwood Creek joins Lower Silver Creek just downstream of the Thompson Creek confluence point. Norwood and Thompson Creeks are Lower Silver Creek's major tributaries.

Lower Silver Creek initially flowed through the LCRP site in a northerly direction, but during construction of the park, it was re-aligned to run along the east border of Capitol Expressway making a right-angle turn to the east at Cunningham Avenue. The creek then runs along Cunningham Avenue for approximately 1,900 feet at which point the creek is joined by Flint/Ruby Creek and makes a right-angle turn to the north to flow under Cunningham Avenue. The Cunningham Avenue Bridge is a clear span arched support structure with sacked-concrete abutments slopes.

Lower Silver Creek enters the park through a 5-cell box culvert with concrete wingwalls at the Tully Road crossing and changes considerably in its channel geometry. Within the park, the creek is about 175 feet wide and 5 feet deep with an average slope of 0.1%. When re-aligned in 1978, Lower Silver Creek with the lower area of the park (current Raging Water parking lot) as part of flood conveyance areas, i.e. floodplain was planned to convey up to 10 year flood event. Therefore, frequent inundation of the Raging Water parking lots was anticipated in the original design. Site visit showed that some sediment deposition and dense vegetation on the creek banks and floodplain has occurred. Our hydraulic calculation indicates that today the capacity of creek itself is estimated to be about 450 cubic feet per second (cfs), which is equivalent to a 1- or 2-year flood event and the Raging Waters parking lot adjacent to the creek is frequently flooded which is consistent with the original design intent This matches what the park maintenance staff has observed on the field (see Figure 2-6)..

LCRP plans and a 1981 letter from Nolte and Associates to the City (see Appendix A for the 1981 letter), indicate the existence of a side-channel overflow weir along Lower Silver Creek upstream of Cunningham Avenue. Planning study field visits did not locate this weir; however, there appears to be an in-stream weir at Cunningham Avenue as the 2012 survey results show that the invert elevation of Lower Silver Creek at that location is about 2.85 feet higher than the elevations immediately upstream and downstream.

Figure 2-6. Flooding at the Raging Waters parking lot in December 2012



The total length of Lower Silver Creek within the park between Tully Road and Cunningham Avenue is about 4,700 feet. A vehicular bridge with concrete piers exists at about the midway point along this stretch of creek near the Raging Water parking lot. This bridge connects to a levee and maintenance road located along Lower Silver Creek's outer most bank relative to the park. The levee, not certified by FEMA, begins at Tully Road and continues downstream to Cunningham Avenue.

The following photos in Figures 2-7 to 2-17 depict the condition of the creek in March 2013 and are presented in an upstream to downstream order from the Lower Silver Creek–Thompson Creek confluence point to Cunningham Avenue.



Figure 2-7. Transition point of Lower Silver Creek from Pipe to Channel

At the confluence with Thompson Creek, looking upstream



Figure 2-8. Confluence point of Norwood Creek and Lower Silver Creek, looking toward the east bank

Note the sediment build-up in the middle of the channel



Figure 2-9. Lower Silver Creek, looking upstream from confluence point with Norwood Creek

Note the sediment build-up in the middle of the channel



Figure 2-10. Outfalls on the west bank of Lower Silver Creek

Eastridge Shopping Center in the background



Figure 2-11. Lower Silver Creek looking at the upstream face of the Tully Road Bridge



Figure 2-12. Lower Silver Creek looking at the downstream face of the Tully Road Bridge



Figure 2-13. Lower Silver Creek at Tully Road Bridge looking downstream into LCRP

Figure 2-14. Lower Silver Creek along the west side of LCRP, looking upstream

Majority of the creek bed is covered with vegetation growing in accumulated sediment



Figure 2-15. Existing drainage from Raging Waters parking lot into Lower Silver Creek

Raging Waters parking lot in the background



Figure 2-16. Vehicular Bridge over Lower Silver Creek, looking downstream

Located adjacent to Raging Water parking lot



Figure 2-17. Cunningham Avenue Bridge over Lower Silver Creek, looking at the upstream face



The confluence of Lower Silver Creek (at left) with Flint/Ruby Creeks (at right) immediately upstream of the Cunningham Avenue Bridge

Flint and Ruby Creeks

Flint and Ruby Creeks flow along the northern and eastern borders of the park respectively and are sometimes referred to as Flint/Ruby Creek. The creeks flow independently from the eastern foothills then under White Road located along the east side of the park. Ruby Creek begins in the park at approximately 650 feet south of the park's east entrance and Flint Creek enters the park at roughly midway between the park's east entrance and the park's northeast corner. Ruby Creek flows northerly along the east border of the park, under the park's east entrance, then directly into Flint Creek. Flint Creek continues to flow north along the eastern border of park then makes a right-angle turn to the west at Cunningham Avenue. Flint Creek then joins Lower Silver Creek just upstream of Cunningham Avenue.

Within the park, Flint/Ruby Creek is a trapezoidal earthen channel with an earthen berm that is not certified by FEMA, along its outermost bank relative to the park. The banks are densely vegetated with grass, brush and trees. Flint/Ruby Creek is 90 feet wide and 12 feet deep with an average channel slope of 0.2%. In the park, Flint Creek's total length is approximately 450 feet and Ruby Creek's total length is approximately 1,450 feet. Flint/Ruby Creek's existing flow conveyance capacity is estimated to be 280 cfs, which is equivalent to a 5-year flood event.

A pedestrian bridge crosses Flint Creek at the northeast corner of the park. Immediately upstream of the pedestrian bridge, on Flint Creek's park interior top of bank, is a 160-foot long concrete side-channel overflow weir with a top elevation of 128.7 feet NAVD88 (the dimensions of the weir are from the December 1982 Phase III City plans for LCRP). The weir allows flows from higher storm events to overflow into the park for flood storage.

The following photos in Figures 2-18 to 2-22 depict the condition of the creeks in March 2013 and are presented in downstream to upstream order.



Figure 2-18. Flint Creek along the north side of LCRP

Looking upstream



Figure 2-19. Downstream face of Pedestrian Bridge over Flint Creek at the northeast corner of LCRP



Figure 2-20. Concrete Weir upstream of the Pedestrian Bridge on Flint/Ruby Creek

Looking northeasterly at the weir located in the far background

Figure 2-21. Confluence point of Flint and Ruby Creeks

Looking toward the east bank at where Flint Creek enters LCRP through two outfalls



Figure 2-22. Ruby Creek along the east side of LCRP

Looking upstream



2.4 Previous Studies and Improvements

Below is a high level summary of LCRP studies and improvements completed to date. A comprehensive list of the studies can be found in the reference section at the end of the report.

2.4.1 1976 Preliminary Studies

In 1976, four preliminary studies were performed for the City in support of the conceptual planning of LCRP. The four studies focused on the preliminary engineering parameters for the planned park. A short summary of these investigations are listed below:

1. Geotechnical Investigation – by Woodward-Clyde Consultants, September 1976

A preliminary soil analysis was conducted with recommendations provided regarding the adaptability of the planned park site for a man-made lake and levee around the site's perimeter. For the most part, the native near surface soils appeared to be relatively impervious and capable of holding water. A clay liner or cut-off was recommended for areas where silt materials were encountered. The clay material excavated was deemed usable for construction of the planned levee around the park's perimeter. In addition, the study found potential for park flooding to be caused by groundwater which would necessitate the need of a subsurface drainage system.

2. Water Quality Investigation – by URS Research Company, September 1976

The quality of the water sources available for the planned park site were studied and compared to the standards and criteria required for water-related recreational activities such as swimming, fishing, boating, etc. Based on availability and costs, local groundwater was selected to be the prime water source to supply water to the lake and landscape irrigation, while treated water from the East Pipeline was selected for other water consumptive activities.

Water from Lower Silver Creek was found to not be a desirable source for the lake due to high turbidity and bacterial levels.

3. Sedimentation Study – by Woodward-Clyde Consultants, September 1976

A preliminary sedimentation study found that the streams had the capacity to transport large volumes of sediment into the lake basin and recommended the diversion of the creeks around the lake to minimize the potential for sedimentation of the lake. With the diversions, water carrying suspended sediments would only spill into a portion of the park during larger flood events.

4. Hydraulic Operations Investigations – by Nolte and Associates, September 1976

A system of greenbelt channels and side-channel overflow weirs were proposed to allow the use of low areas of the park for off-channel storage of peak flows during larger flood events. Flood flows with recurrence intervals of up to 10 years were planned to flow within the greenbelt channels and flow around the periphery of the park. Water would flow over the side-channel weirs into the park only when flow exceeded the 10-year flood

event. Storing water in the park would reduce peak flows to the downstream reaches of Lower Silver Creek.

2.4.2 LCRP Master Plan—1976, 1978, 1983, 1990, and 2006

In September 1978, an additional geotechnical investigation was performed by Woodward-Clyde Consultants to provide more detailed design information to the City for the planned park. The investigation resulted in an addendum in 1978 to the 1976 LCRP Master Plan to reduce the size of the park from 240 to 202 acres and the size of the lake from 65 to 50 acres. Following this, Nolte and Associates provided a letter dated December 1981 to the City which noted that due to the reduced size of the park and better flood flow calculations, parts of the park had to be redesigned to provide the flood storage capacity specified in the 1978 Agreement (*i.e.*, the elevation of the lake and meadow areas were lowered).

In 1983, the 1978 LCRP Master Plan was amended to include the construction, operation, and maintenance of a 24-acre water-themed attraction. The attraction is located in the northwest portion of the park and is known as Raging Waters. The 1983 LCRP Master Plan was again updated in 1990 to re-assess and revise the design guidelines to accommodate higher than projected attendance levels. The LCRP Master Plan was last updated in 2006 to include a skate park (in the southeast area of the park that was originally planned for a swim lagoon) and a pedestrian entrance from South White Road.

2.4.3 1982 Division Safety of Dams Jurisdictional Review

In 1982, the California Department of Water Resources, Division of Safety of Dams (DSOD) performed a jurisdictional status review of the flood detention facility and concluded that all embankments of concern in the park are classified as creek levees. Therefore, according to Section 6004 of Division 3 of the Water Code, the flood detention facility is currently not within the State's jurisdiction. It is a desire and request of both the District and the City to maintain this non-jurisdictional status. If the jurisdictional status changes, the City would be the responsible party, since they own the park in fee title, for meeting DSOD's jurisdictional requirements.

2.4.4 1998 FEMA Study

The most recent FEMA floodplain study available for the area is from 1998. It shows that a 100-year flood event would flood residential areas upstream (south) of Tully Road and overtop the levees along Capitol Expressway and Cunningham Avenue (see Figure 1-1 for the 1-percent FEMA floodplain limit). A cursory review of FEMA's hydraulic model indicates that the flood storage available at LCRP was not considered in FEMA's flood insurance study.

2.4.5 Studies after 2000

In 2000, the District prepared a topographic survey map of the park to document the park's graded condition. The District then retained Nolte and Associates to analyze the park's flood storage capacity based on the 2000 topographic survey (Nolte and Associates Lower Silver/Thompson Creeks Hydrology Study, November 2000). The analysis indicated that at the elevations specified in the 1978 Agreement, the park's 2000 graded condition would allow for greater storage of floodwaters than planned for in 1978. This in turn would allow for attenuation of a larger portion of the 1-percent flood event.

In 2002, Schaaf & Wheeler was retained by the District to expand the November 2000 Nolte and Associates Hydrology Study down to Coyote Creek (Schaaf & Wheeler Lower Silver Creek Final Hydraulic Report for the LSC Project, March 2002). Their study indicated that the flood detention in Lake Cunningham would reduce 100 year peak flow and release 2,810 cfs to its downstream with the proposed improvements in their report.

In 2006, the San Francisco Estuary Institute published the Coyote Creek Watershed Historical Ecological Study. The report synthesized historical evidence into a picture of how the Coyote Creek Watershed, including the LCRP area, looked and functioned before intensive modification. It showed how the contemporary landscape was shaped and discussed the interrelated processes of habitat creation and maintenance, flood protection, and water supply within a practical local context.

In 2008, the City retained Callander Associates to prepare a Feasibility Report for trail and pathway improvements at the park. The report identified pathways in the park that would provide visitors with a complete walking loop around the lake and recommended ways to connect these paths to uses adjacent to the park (including regional trail systems and transit stops). The International Mountain Bicycling Association, Trail Solutions Program, also prepared a report for the City in the summer of 2012 for additional recreational components at the park. The report developed conceptual trail and bike park designs in the vicinity of the skate park.

In 2010, the City hired Questa Engineering Corporation to investigate potential measures to improve Lake Cunningham's water quality. Problems in the lake include high fecal coliform levels, algal blooms, low dissolved oxygen concentrations, and fish kills. Measures aimed at improving water quality conditions focused on removing nutrient sources and accentuating destratification processes (*i.e.,* mixing).

2.4.6 Completed Improvements

The following is a list of major improvements that have been completed at LCRP:

- 1983—Lake and park construction completed. Lower Silver, Ruby, and Flint Creeks were diverted around the park and levees were built around the site's perimeter, but major flood protection elements were not constructed.
- 1984 and 1994—Lake edge stabilized using boulder rip-rap and bulkheads.
- 1987—Raging Waters Theme Park construction completed.
- 1998—Vehicular Bridge constructed over Lower Silver Creek to increase parking availability.
- 2001—Aerator system installed at the northwest end of the lake to improve water quality.
- 2008—Skate park construction completed.
- City of San Jose has been performed debris removal and basic channel maintenance within the park since the park was built.

2.4.7 District LSC Project

The District has been working on the LSC Project to protect nearly 3,200 homes and businesses located downstream of LCRP and along Lower Silver Creek from a 100-year flood event since the 1980's. The LSC Project consists of three project phases. Improvements for Phase 1, Reaches 1-3 (from confluence of Coyote Creek to Interstate 680), were completed in 2006. In 2009, federal stimulus funds allowed improvements for Phases 2 and 3 to continue. Phases 2 and 3, Reaches 4-6 (from Interstate 680 to Cunningham Avenue) are scheduled to be completed by 2016. The LSC Project improvements are based on the design assumption that the flood detention facility will attenuate a significant portion of the 1-percent flow from Lower Silver Creek, Flint Creek, and Ruby Creek in LCRP so that the flow released from the flood detention facility into Lower Silver Creek downstream of LCRP can be safely conveyed.

2.5 Site Characteristics

2.5.1 Geology

LCRP is located on the east side of the Santa Clara Valley on the Evergreen alluvial apron. The steep hills of the Diablo range border LCRP on the east and a relatively flat San Jose plain lies to the west. The alluvial fans were formed as streams emerged from the eastern foothills onto the Santa Clara Valley floor and deposited unconsolidated materials as their slopes flattened (District's Groundwater Monitoring and Analysis Unit). A lower-lying basin area known as Laguna Socayre existed in the LCRP area and was a natural basin that supported mosaics of wetland habitats including wet meadows with saltgrass and alkali patterns, willow groves, and perennial freshwater wetlands, or lagunas (2006 San Francisco Estuary Institute report). The wet meadows captured water and fine sediments, sands, silts and clays which predominately characterize the native soils underlying the area.

Active faults in the area include San Andreas, Hayward, Monte Vista East, Monte Vista West, and Calaveras. A major earthquake at any of these sites could produce a strong ground shaking in the study area. No additional geology investigation is anticipated for the staff-recommended alternative.

2.5.2 Groundwater

The 1976 and 1978 geotechnical investigation reports prepared by Woodward-Clyde Consultants found that the groundwater level in the LCRP area fluctuated seasonally. The groundwater profile appeared to decrease in depth from the north to the south and may be influenced locally by the water level in Lower Silver Creek. Groundwater was observed in roughly half the exploratory borings drilled for the investigations. Groundwater was encountered in some cases at an elevation of 122.8 feet NAVD88, at very near the same elevation of the lake water and meadow surfaces. As a result, installation of meadow subdrains was recommended in the 1978 design geotechnical report. Even with the installed meadow drainage system, the meadow surface is observed to be soggy year round (Corrales, 2013). Park staff also reported that groundwater levels have increased since park construction due to the addition of storm drain outfall improvements under White Road to Flint/Ruby Creeks (Corrales, 2013).

Updated information comparing the historical and seasonal fluctuations of the groundwater in the area can be found in a report prepared by the District's Groundwater Monitoring and Analysis Unit. No additional groundwater investigation is anticipated for the staff-recommended alternative.

2.5.3 Water Quality

Water quality issues associated with the creeks flowing along the park's perimeter are unknown at this time. However, the creeks can be greatly affected by pollution carried in contaminated surface runoff. Non-point source pollutants such as oil, grease, plant and animal debris, pesticides, litter, and heavy metals are washed into the local storm drains that drain to the creeks from streets, residential and business areas, parking lots, and other exposed surfaces.

The creeks can also be affected by the return overflow from the park and lake after large storm events. Specifically, Lake Cunningham is known to have serious water quality impairments. Sediments from exposed slopes surrounding the lake, nutrients from bird and animal feces, and surface contaminants from parking lots within the park are transported directly into the lake by surface runoff. The park historically was a natural saline sink and the park soils are still high in salt content. With no major lake outflow to remove the suspended sediments and nutrients from the system, the lake is not refreshed and it has become a nutrient sink with elevated fecal coliform and low dissolved oxygen levels. On a seasonal basis, typically from June to October, the warm water and light intensity stratifies the lake and exacerbates low oxygen levels in the bottom layer, as a result, major fish die-offs occur on average every two years. Along with the high nutrient levels, these conditions also spur algal blooms in the lake. All of these conditions are contributing to the lake's impaired water quality which has resulted in the lake being closed to swimmers and wind surfers since 1996.

Appropriate measures will be included during design of the staff-recommended alternative to not degrade the existing water quality.

2.5.4 Biological Resources

Existing Habitat

The surrounding area to the park is bordered by dense urban and suburban development. This has resulted in the creeks surrounding the park being heavily modified. Modifications include construction of concrete lined channels and multiple grade control structures.

The majority of the riparian corridor in the eastern portion of the park along Flint Creek and Ruby Creek is dominated by non-native trees with a manicured understory, while the riparian corridor in the western portion of the park along Lower Silver Creek is comprised of dense willow stands intermixed with primarily non-native trees. The trees along Flint and Ruby Creek and Lower Silver Creek could support nesting birds (including raptors) and the stream could support western pond turtles. A chain-link fence borders the entire park which limits wildlife corridors. The area along Lower Silver Creek to both the north and west is heavily managed and is dominated by barren ground that is covered by a thick layer of mulch, access roads, and stockpiled sediments.

Within the park, Lake Cunningham provides open water habitat with some emergent vegetation along its banks. Surrounding grassy and landscaped areas in the park are seasonally inundated

by rainfall, runoff and the high groundwater table, which provides some “wet” areas that may support seasonal wetland vegetation.

Special Status Wildlife Species

The status of sensitive species in the park has not been fully evaluated. Additional analysis will be needed to determine the potential for sensitive wildlife species and sensitive plant species to exist and be affected by the staff-recommended alternative. In general, special status wildlife species with potential to occur in or near the park area include the burrowing owl, San Francisco dusky-footed woodrat, and western pond turtle. The LCRP area may also support nesting habitat for a variety of birds.

Valley Habitat Plan (Habitat Conservation Plan)

The District is one of the original applicants in the Santa Clara Valley Habitat Plan (VHP) which covers approximately 520,000 acres in Santa Clara County. The VHP is a joint habitat conservation plan and natural communities conservation plan developed to serve as the basis for issuance of incidental take permits and authorizations pursuant to Section 10 of the federal Endangered Species Act and California Natural Community Conservation Planning Act. The VHP partners are: the Cities of San Jose, Gilroy, and Morgan Hill; Santa Clara County; the Santa Clara Valley Transportation Authority; and the District. The Cunningham Flood Detention Facility is located within the VHP permit area. The staff recommended alterative is a covered project under the VHP. The VHP models habitat for a number of protected species. Table 2-1 lists species with modeled habitat along Lower Silver Creek.

Table 2-1: Protected Species with Modeled Habitat along Lower Silver Creek

Scientific Name	Common Name	Status	Modeled Habitat
Rana draytonii	California red-legged frog	Federal threatened State species of special concern	Breeding habitat
Rana boylii	Foothills yellow-legged frog	State species of special concern	Primary habitat
Clemmys marmorata	Western pond turtle	State species of special concern	Primary/secondary habitat
Athene cunicularia hypugaea	Western burrowing owl	Federal Migratory Bird Treaty Act (MBTA) species State bird species of special concern	Occupied habitat
Agelaius tricolor	Tri-colored blackbird	Federal MBTA species State bird species of special concern	Primary habitat

Activities required for the staff-recommended alternative would be required to be consistent applicable VHP conditions and applicable Avoidance and Minimization Measures (AMMs).

2.5.5 Cultural Resources

Section 2.4.6 includes a discussion of improvements that were completed at LCRP. The majority of the construction occurred in the 1980's and consisted of excavation of the lake, realigning the creeks, placement of fill along the park's perimeter, installation of utilities for the park, and extensive grading for structures, interior roads, parking lots, pathways, and meadows. The most recent construction in the park has been for the City's skate park in 2008. For the City's skate park project, a cultural resource evaluation was prepared by Archaeological Resource Management in December 2005. The evaluation found no recorded archaeological sites located in the area. A general surface reconnaissance also found no traces of prehistoric or historic cultural resources.

Based on the extensive construction that has occurred within the park, the potential for encountering subsurface prehistoric materials during construction of the staff-recommended alternative will be low. This will be appropriately documented during preparation of the staff-recommended alternative's environmental documents.

2.5.6 Hazardous Materials

A Phase I and II Environmental Site Assessment was completed in 2006 for the City's skate park. The site assessment found concentrations of constituents of potential concern are consistent with background concentrations for the region. Further investigations for the presence of hazardous materials will be conducted during design of the staff-recommended alternative.

2.5.7 Utilities

Utility service in the park for various facilities is provided by San Jose Water Company (water service), Pacific Gas and Electric (PG&E, gas and electric service) and the City (sanitary and storm sewers). PG&E has an easement along the western boundary of the park in the vicinity of Lower Silver Creek's levee along Capitol Expressway. Three high pressure gas lines are located within the PG&E easement. There are two 12-inch storm drains located in the parking area northwest of Raging Waters and in the marina parking lot that outfall into Lower Silver Creek. Additional utility investigations and coordination will be conducted during design of the staff-recommended alternative.

2.5.8 Sedimentation

Lower Silver Creek is heavily influenced by sediment coming from Thompson Creek. A drop structure at Thompson Creek and Quimby Road just upstream of the Lower Silver Creek confluence acts as a sediment trap which collects a large portion of the coarser bed load. However, the remaining suspended load consisting of fine sediment particles settles out in Lower Silver Creek predominately from Thompson Creek to Cunningham Avenue. Approximately 50,000 cubic yards of total sediment has been removed from this area in 2003 and 2004 by the District. Sedimentation does not appear to be a major issue for Ruby and Flint Creeks.

In Lower Silver Creek within the park, dense vegetation has established on the deposited sediment in the creek and on the banks and floodplain encouraging additional sedimentation. The sediment build-up and vegetation growth has reduced the creek's capacity. When re-aligned in the 1970's, Lower Silver Creek was planned to convey a 10-year flood event, today its capacity is estimated to be about 450 cfs, which is equivalent to a 1- or 2-year flood event. This reduction in capacity does cause frequent flooding to the Raging Water's parking lot. Despite this, the study team was directed by the Hydraulic Unit to investigate alternatives that would not disturb the sediment in the creek because it was assumed that sediment in the channel has reached a stable state and is no longer accumulating.

The staff-recommended alternative assumes sediment will not be removed in Lower Silver Creek from Tully Road to Cunningham Avenue. The District's Hydraulic Unit will perform a sediment analysis in late 2015 to confirm this assumption.

2.5.9 Geotechnical

The District retained Kleinfelder West, Inc. in late 2014 to conduct a geotechnical investigation of the existing perimeter creek levees to determine their condition with respect to FEMA acceptance for certification. The Geotechnical Investigation Report was completed in May of 2015 and indicated that the existing levees appear to have been constructed using appropriate materials for use as structural levee embankment fill. These findings are based on the results of a screening-level geotechnical investigation. A more comprehensive investigation will be required during design of the staff-recommended alternative.

CHAPTER 3. COMMUNITY OUTREACH

Outreach activities have been performed to inform stakeholders of the planning study and its progress as well as to solicit stakeholder feedback throughout the planning study process. The success of the planning study to identify a staff-recommended alternative depends on the collaboration with these interested stakeholders. Stakeholders can include individuals, agencies, and organizations which may affect or be affected by the staff-recommended alternative.

3.1 Meetings with City of San Jose

Coordination meetings with City park staff were held to provide study progress updates and understand the projects the City has developed in and near LCRP. These meetings were opportunities to discuss mutual benefits and impacts and collect feedback and comments.

- May 31, 2012: met with City staff to introduce the planning study.
- June 20, 2013: met with City staff to understand the site.
- November 1, 2013: met with City park staff to garner input on the planning study's problem definition report.
- September 25, 2014: met with City park staff and resident Velma Million to discuss the conceptual alternatives.
- February 3, 2015: met with City park manager, Nicolle Burnham, to introduce her to the planning study.
- June 1, 2015: met with residents Velma Million and Travis Hyatt, and City park staff to discuss Lake Cunningham's poor water quality.
- Participated in quarterly meetings with City Parks, Recreation and Neighborhood Services staff to provide planning study updates and coordinate as needed.

3.2 Neighborhood Survey Letter

A survey letter was sent out on February 17, 2014, to the business and residents living in and around the park site. The letter introduced the planning study and asked for residents input and observations to help finalize the planning study's problem definition report.

More than 5,000 letters were sent out and approximately 120 responses were received. Many valuable flooding photos from the City and Raging Waters were collected.

3.3 Public Meeting

A public meeting was held on December 2, 2014, where five conceptual alternatives were presented and discussed with the attendees; the City was also present at the meeting. Input was gathered to better understand the public's concerns with the conceptual alternatives and to

aid in the identification of the planning study's feasible alternative(s). All residents and businesses near the project site were invited to the meeting.

This was the first meeting for the public to hear about the purpose of the project, project objectives, planning study steps and schedule, and the five conceptual alternatives developed to date. Staff from the City also discussed the City's plans to study Lake Cunningham's water quality issues and concerns.

The public present at the meeting provided clear input that they did not support any alternatives that proposed improvements within the park. The only alternative the public supported was the alternative that looked to only modifying the creek levees along the periphery of the park to provide the necessary freeboard to meet FEMA freeboard requirements.

CHAPTER 4. PROBLEM DEFINITION

A Problem Definition Report (PDR) was completed for the planning study in December of 2013. The purpose of the PDR was to define the problems and refine the project objectives if necessary to guide the development of project elements and eventually alternatives to meet the project objectives. Below is a summary of key PDR findings and additional findings determined in 2014 that drove the development of the alternatives and lead to the screening criteria used to determine whether a conceptual alternative would qualify as a feasible alternative.

4.1 2013 PDR Flood Storage, Hydrology, Hydraulic Findings

The District has been working on the LSC Project to protect nearly 3,200 homes and businesses located downstream of LCRP and along Lower Silver Creek from a 100-year flood event since the 1980's. The LSC Project improvements are based on the design assumption that the flood detention facility will attenuate a significant portion of the 1-percent flow from Lower Silver Creek, Flint Creek, and Ruby Creek in LCRP so that the flow released from the flood detention facility into Lower Silver Creek downstream of LCRP can be safely conveyed.

The PDR identified that additional flood improvements in LCRP would be required to meet the LSC Project design assumptions. This determination was based on initial planning study hydraulics premised on Schaaf & Wheeler's 2002 LSC Project hydraulic analysis and the District's 2012 topographic survey data. Sections 4.1.1 and 4.1.2 provide the PDR flood storage, hydrology and hydraulic findings.

4.1.1 Flood Storage and Associated Floodwater Surface Elevation

In 2000, the District prepared a topographic survey map of the park to document the park's graded condition. The District then retained Nolte and Associates to analyze the park's flood storage capacity based on the 2000 topographic survey. In 2002, the District further retained Schaaf & Wheeler to expand Nolte and Associates' 2000 analysis down to Coyote Creek. Schaaf & Wheeler's analysis recommended the LSC Project's 100-year design flow of 2,810 cfs.

In 2012, the District prepared a new topographic survey map of the park for the planning study. The District's Hydraulic Unit then updated Schaaf & Wheeler's 2002 analysis with the 2012 survey information and identified roughly the same flood storage capacities and associated floodwater surface elevations that were determined in 2002. The District's Hydraulic Unit considered the difference between the 2002 and 2012 storage capacities to be minimal and advised developing the planning study alternatives based on the more up to date 2012 survey information.

Table 4-1 summarizes the flood storage capacities and associated floodwater surface elevations determined over the years.

Table 4-1: Summary of Park Flood Storage Determined over the Years

	Available Flood Storage acre-feet	Associated Floodwater Surface Elevation feet NAVD88
1978	380	127.75
	860	132.75
2002	425	128
	590*	129.4*
	1,100	133
2012	478	128
	1,016	133

*This storage volume and flood water surface assumed construction of a weir which was never constructed.

4.1.2 Hydrology and Hydraulics

Schaaf & Wheeler's 2002 analysis, based on the District's 2000 survey information, determined the following: the peak 1-percent flow at the confluence point of Lower Silver and Flint/Ruby Creeks in the park is 5,059 cfs; the LSC Project 100-year design flow would be 2,810 cfs. Since construction of the LSC Project is nearly complete (construction is to be complete in 2016), the flood detention facility must be able to divert about 2,249cfs into LCRP to ensure the LSC Project can safely convey its 100-year design flow of 2,810 cfs.

In early 2013, the District's Hydraulic Unit developed a planning study existing condition 1-dimensional unsteady hydraulic model to better understand the interaction between Lower Silver and Flint/Ruby Creeks and the park during a 1-percent flood event. The 2013 unsteady hydraulic model showed that approximately 2,137 cfs, would overspill into the park, the floodwater surface elevation in the park would reach an approximate elevation of 132.4 feet NAVD88, and 2,922 cfs would flow into Lower Silver Creek downstream of the Cunningham Avenue Bridge. Since the 2,922 cfs exceeded what the LSC Project was designed to convey, 2,810 cfs, it was concluded that additional flood improvement measures would be required to detain more of the 1-percent flow within the park and ensure the flow released out of the park did not exceed 2,810 cfs.

As a result, in 2014 five conceptual alternatives were developed with associated hydraulic models.

4.2 Additional Findings Determined in 2014

4.2.1 Alternative Hydraulic Models Review

In November 2014, the District's Hydraulic Unit began a technical review of the five conceptual alternative hydraulic models and raised concern with the modeling methodology of the Cunningham Avenue Bridge. This lead to the Hydraulic Unit performing some sensitivity analyses on the hydraulic models that suggested a change to the modeling method of the Cunningham Avenue Bridge. The Hydraulic Unit also determined further refinements were

necessary to the hydraulic models downstream boundary condition and used the results from the Lower Silver Creek hydraulic model to incorporate the refinements. The changes were also applied to the 2013 existing condition hydraulic model.

The updated existing condition hydraulic model showed that approximately 2,243 cfs would overspill into the park, the floodwater surface elevation in the park would reach an approximate elevation of 132.75 feet NAVD88, and 2,816 cfs would flow into Lower Silver Creek downstream of the Cunningham Avenue Bridge (see Appendix B for a memorandum from the District's Hydraulic Unit that summarizes the study's final baseline condition). The study also showed that the existing 36" outlet pipe would drain the lake water level back to 124 feet NAVD88 after the 100 year flood event.

This closely matched the LSC Project's design flow parameters, but the LSC Project's 1-percent design flow would be exceeded by 6 cfs. The District's Hydraulic Unit further investigated whether the LSC Project's channel design could tolerate the 6 cfs increase. The result was that 2,816 cfs could be safely conveyed in Lower Silver Creek downstream of the park. Therefore, additional improvements to detain more of the 1-percent flow within the park would not be necessary after all, however, it was realized that the creek levees along the periphery of the park did not have adequate freeboard to meet FEMA freeboard requirements.

Learning that the flood detention facility actually has adequate capacity but only lacks adequate freeboard made it clear that the only flood improvements required would be to raise or add floodwalls to the creek levees along the periphery of the park by up to 3 feet to ensure the creek levees meet FEMA freeboard requirements.

4.2.2 1978 Agreement

The 1978 Agreement included planned flood detention provisions for two minimum flood storage capacities with associated floodwater surface elevations of 127.75 feet NAVD88 and 132.75 feet NAVD88 (see Table 4-1). The City built park improvements they did not want flooded above the highest of these elevation, above 132.75 feet NAVD88.

The final 2014 existing condition hydraulic model determined that for a 100-year flood event, the floodwater surface elevation in the park would reach an approximate elevation of 132.75 feet NAVD88. Therefore, the flood detention facility is operating under the planned 1978 floodwater surface elevation of 132.75 feet NAVD88.

4.2.3 DSOD Jurisdictional Status

The PDR included information about a DSOD jurisdictional status review of the flood detention facility's existing condition in 1982. It was noted that DSOD would have to be consulted to re-evaluate the jurisdictional determination for any proposed flood improvement measures in the park since those measures could trigger a DSOD jurisdictional change. Discussions with the District's Dam Safety Program Unit and with the City in 2014 determined that a jurisdictional change would not be acceptable by both the District and the City. Therefore, alternative 2 that would change the jurisdictional status from non-jurisdictional were not considered to be an acceptable alternative.

4.2.4 Public Input

A public meeting was held on December 2, 2014 where the five alternatives were presented and discussed; the City was also present at the meeting. The least acceptable alternatives to the public were the alternatives that proposed the addition of flood improvement measures within the park. The only alternative that was supported by the public at the meeting was the alternative that looked to only modifying the creek levees along the periphery of the park to provide the necessary freeboard to meet FEMA freeboard requirements. The City was also in agreement with the public's interest.

4.2.5 Geotechnical Investigation

The PDR identified that a geotechnical investigation should be conducted of the existing periphery creek levees to determine their condition with respect to FEMA acceptance for certification. Kleinfelder West, Inc. was retained to perform the geotechnical investigation. The Geotechnical Investigation Report completed in May of 2015 indicated that the existing levees appear to have been constructed using appropriate materials for use as structural levee embankment fill. Findings also indicated that the levees could be raised by up to 3 feet and that the levees could accommodate the addition of a floodwall.

4.2.6 Natural Flood Protection Process

The District's Natural Flood Protection (NFP) process is intended to provide guidance on alternative evaluation and selection for NFP projects. Guidance on conforming to the NFP requirements is contained in the District's Watersheds QEMS Work Instruction WW75125. On December 22, 2014, a meeting was held to discuss whether the NFP Process was applicable to the Cunningham Flood Detention Facility Certification Project. At the meeting, the five conceptual alternatives that were developed were discussed in detail. These conceptual alternatives were as follows:

- Conceptual Alternative 1—Modify Periphery Creek Levees
- Conceptual Alternative 2—Isolate Detention Area to Lake
- Conceptual Alternative 3—Box Culvert Bypass underneath Parking Lot
- Conceptual Alternative 4—Re-route Flow through Lake
- Conceptual Alternative 5—Widen Lower Silver Creek

All the conceptual alternatives require modification to the periphery creek levees to meet FEMA freeboard requirements, but only Conceptual Alternative 1 requires only modification to the periphery creek levees and no other additional flood improvement measures. A high level summary of the conceptual alternatives can be found in Appendix C.

The December 22, 2014 meeting was attended by District's NFP Work Instruction owner, NFP subject matter experts and the planning study team. At the meeting it was determined that the NFP process does not apply to this planning study and that there was only one practicable alternative, the alternative that would only modify the creek levees along the periphery of the park to provide the necessary freeboard to satisfy FEMA freeboard requirements. A memo to the project files documenting the NFP meeting can be found in Appendix D.

4.3 Summary

In 2014, it was determined that the flood detention facility does have adequate flood storage capacity to meet all the project objectives except the objective of meeting FEMA freeboard requirements. The flood detention facility only lacks adequate freeboard and, therefore, all that needs to be done is to either raise or add floodwalls to the creek levees along the periphery of the park to ensure they meet FEMA freeboard certification requirements. This means that the conceptual alternatives that proposed any other flood improvement measures within the park were no longer necessary or required to be further carried forward in the planning study.

Additional findings determined in 2014, as described in Section 4.2, further supported dropping the other flood improvement measures that were developed. These findings are because of the following: the flood detention facility is operating under the planned 1978 floodwater surface elevation of 132.75 feet NAVD88; modifying the periphery creek levees would not change the DSOD jurisdictional status; the public and the city only found modifying the periphery creek levees to be an acceptable alternative; the geotechnical investigation concluded that the levees can support being modified and that they were in good condition with respect to FEMA acceptance for certification; and the District's NFP process also determined modifying the periphery creek levees to be the only practicable required improvements.

Conceptual Alternative 1, modify the periphery creek levees, was determined to be the project's only practicable alternative. The project team is therefore recommending Conceptual Alternative 1 to be the Staff-Recommended Alternative.

CHAPTER 5. STAFF-RECOMMENDED ALTERNATIVE

The staff-recommended alternative proposes to modify the periphery creek levees to satisfy FEMA freeboard requirements. Sections 5.1 and 5.2 describe the design criteria and provide a more detailed description of the staff-recommended alternative.

5.1 Design Criteria

The following is the staff-recommended alternative general design criteria.

5.1.1 General

a. Design life of the Project is 50 years.

b. Flood improvement measures will be designed to meet FEMA requirements.

- 3.0 feet of freeboard will be provided in sections of creek with a levee or floodwall.
- 4.0 feet of freeboard will be provided in sections of creek with a levee or floodwall within 100 feet of structures or wherever flow is constricted.

c. Crown width of the raised levee will be minimum 10 feet.

5.1.2 Levees

a. Levees will have a minimum side slope of 2:1 (horizontal: vertical or 2H:1V).

b. Levees will be built to the height of 131.ft NAVD88 plus 3 ft of freeboard and an additional 1 foot to account for total settlement anticipated due to primary consolidation Once geotechnical investigation in design phase is completed, total settlement amount will be revised. .

5.1.3 Floodwalls

a. Floodwalls along Flint and Ruby Creeks will be constructed at the top of berms to the height of 131.1 ft NAVD88 plus 3 feet of freeboard..

5.2 Staff-Recommended Alternative

The existing creek levees and berms along the periphery of the park adjacent to Lower Silver and Flint/Ruby Creeks would be modified to provide the necessary freeboard to meet FEMA certification requirements. Figure 5-1 depicts the staff-recommended alternative.

Lower Silver Creek's existing levee adjacent to Capital Expressway and Cunningham Avenue would be raised by up to 3 feet. The minimum crown width of the raised levee will be 10 feet. The side slopes of the levee would be minimum 2:1.

A floodwall would be constructed on the top of existing berms from the Cunningham Avenue Bridge toward the east to White Road and then southerly along White Road up to the park's White Road entrance.. The floodwall would be from 1.5 to 3 feet high.

Cunningham Avenue's upstream bridge headwall has adequate freeboard; however additional improvements would be necessary to ensure Lower Silver Creek's raised levee and Flint Creek's floodwall tie into Cunningham Avenue Bridge's upstream headwall. A transition floodwall would be constructed to connect the bridge's headwall to the raised levee and the floodwall.

Tie-in walls and re-grading would have to occur at the park's interior vehicular bridge to maintain access to the maintenance road located on top of the Lower Silver Creek levee To do so, a floodwall of approximately 150 feet in length and 2-foot high would be constructed on the outside hinge point of the levee.

The proposed floodwall along Flint Creek may require relocation of the City's garbage compactor and pedestrian entrance located at the corner of Cunningham Avenue and White Road. The District will coordinate with the City on the garbage compactor and pedestrian entrance relocation during the project design.

Prior to the completion of the project, the Water District and City of San Jose will work together to update/revise the 1978 Agreement and describe maintenance responsibilities clearly for both parties.

Figure 5-1. Staff-Recommended Alternative
Conceptual Alternative 1: Modify Periphery Creek Levees

5.3 Right of Way Requirements

The District has a non-exclusive easement to all park lands for the flood improvement measures in LCRP which include the creeks, creek levees, and overflow weirs. The easement, recorded in October of 1980, includes language that allows for the District to take measures necessary for flood protection purposes provided the measures are compatible with the park uses (see Appendix A for the easement).

The staff-recommended alternative lies within the District's easement.

5.4 Agency Approval Requirements

The staff-recommended alternative would require review and/or approval by the following agencies:

- **California Department of Fish and Wildlife (CDFW)**—California Fish and Game Code Section 1602 Streambed Alteration Agreement (SAA). CDFW Code section 1602 requires any person, State or local governmental agency, or public utility to notify CDFW before beginning any activity that would do one or more of the following: 1) substantially obstruct or divert the natural flow of a river, stream, or lake; 2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or 3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake. The Staff Recommended Alternative would require an SAA due to the potential removal of trees within the riparian corridor in the vicinity of Lower Silver Creek, Flint Creek, and Ruby Creek.

- **State Water Resources Control Board (SWRCB)**—National Pollutant Discharge Elimination System (NPDES) Permit for discharge of storm water from construction and land-disturbing activities. A NPDES permit is required from SWRCB for any construction project disturbing over an acre. The Staff Recommended Alternative would disturb more than an acre and would require coverage under the General Construction Permit issued by SWRCB. To obtain coverage the District would prepare a Storm Water Pollution Prevention Plan (SWPPP) and submit a Notice of Intent (NOI) to SWRCB.

- **U. S. Fish and Wildlife Service (USFWS)**—Federal Endangered Species Act of 1973 (as amended) and Migratory Bird Treaty Act (16 U.S.C. 703 et seq). If a project may result in "incidental take" of a listed species, an incidental take permit is required. An incidental take permit allows a non-Federal landowner to proceed with an activity that is legal in all other respects, but that results in "incidental taking" of a listed species. USFWS also implements the Migratory Bird Treaty Act (MBTA) which prohibits harm to migratory birds. The Staff Recommended Alternative may affect migratory birds during construction activities. Impacts to migratory birds can usually be avoided through pre-construction surveys and establishment of buffers around active nests.

- **San Francisco Bay Regional Water Quality Control Board (RWQCB)**—Federal Clean Water Act Section 401 Water Quality Certification (WQC) and California Porter-Cologne Act Waste Discharge Requirements (WDR). Federal CWA Section 401 requires that every applicant for a Corps CWA Section 404 permit or Rivers and Harbors Act Section 10 permit must receive certification from the RWQCB that the proposed activity

would not violate State and/or Federal water quality standards. Section 401 WQC would not be required since the Staff Recommended Alternative would not require a Section 404 permit. However, RWQCB has authority over any project that directly or indirectly affects beneficial uses of Waters of the State through the Porter-Cologne Act and issue Waste Discharge Requirements (WDRs) for projects that may affect beneficial uses. Silver, Flint, and Ruby creeks are Waters of the State and the proposed project has the potential to affect beneficial uses of those creeks, depending upon the project design. At the time of 30% design, the RWQCB should be consulted to determine if they will require a WDR for the project.

- **Santa Clara County Valley Habitat Agency**—The Santa Clara Valley Habitat Agency leads the implementation of the Santa Clara Valley Habitat Plan (VHP). The VHP Is both a habitat conservation plan (HCP) and natural community conservation plan (NCCP), or HCP/NCCP. The VHP is a 50-year regional plan to protect endangered species and natural resources while allowing for future development in Santa Clara County. The VHP was adopted in 2013 by all local participating agencies and permits were issued from the USFWS and CDFW.

  The project site is located within the boundaries of the VHP and is a covered project. The project site is designated Agricultural and Valley Floor Lands (Zone B) and burrowing Owl and Tricolored blackbird habitat. The proposed project would be required to comply with the rules, regulations, and policies of the VHP, including review by the Wildlife Agencies and payment of VHP Plan fees for impacts to Zone B and burrowing owl. Upon obtaining VHP coverage, the project would receive incidental take permits for the 16 protected species covered by VHP and would not require separate approvals under the Federal and California Endangered Species Acts.

- **Other State and Local Agencies**—The Staff Recommended Alternative may require construction in the vicinity of roads owned by the City of San Jose and may result in the removal of trees considered significant by *City's* tree preservation ordinance. An encroachment permit or traffic control plan may be required from the City of San Jose for staging or construction activities in the right-of-way of roads maintained by the City. In addition, tree replacements may be required for removal of trees considered significant by the City's tree preservation ordinance.

The staff-recommended alternative would not require approval from the following agencies:

- **U.S. Army Corps of Engineers (Corps)**—Federal Clean Water Act (CWA) Section 404 permit requires Corps authorization for work involving intentional or unintentional placement of fill or discharge of dredged materials into any "waters of the United States." The Staff Recommended Alternative would not require construction below the ordinary high water mark in the "waters of the United States for Lower Silver Creek and or Flint/Ruby creeks. Therefore, a Section 404 permit would not be required from the Corps Regulatory Division.

- **National Oceanic and Atmospheric Administration National Marine Fisheries Service (NMFS)**—Endangered Species Act compliance for marine mammals, saltwater fish, and anadromous fish. The Staff Recommended Alternative would not be expected to affect habitat for species under authority of NMFS.

5.6 Recreational Enhancement Opportunities

City's Parks, Recreation and Neighborhood Services has identified an opportunity for a trail on top of the Lower Silver Creek raised levee and along the Flint/Ruby Creek existing berm. The District will coordinate with the City's endeavors in its trail creation.

CHAPTER 6. MAINTENANCE

As stated in the 1978 agreement, "District *is* responsible for maintenance for flood control uses of the channel of stream within the park and of flood control structures of and appurtenant to such stream". As such, the District maintains the creeks in the park for activities such as inspection of the levees for repairs and activities for sedimentation control, vegetation control, and removal of fallen tree/debris.

6.1 Maintenance History

Since 2003, the District has performed large scale sediment removal work along Lower Silver Creek predominately from Cunningham Avenue to Thompson Creek. Sediment removal episodes that have occurred in this section of the creek in the last ten years are listed below:

January 2003	24,500 cubic yards of sediment was removed from the west bank of Lower Silver Creek from Quimby Road to Cunningham Avenue
January 2004	23,743 cubic yards of sediment was removed from the east bank of Lower Silver Creek from Quimby to Tully Road.
September 2011	Approximately 6 feet of sediment was removed from the west bank of Lower Silver Creek from the Thompson Creek confluence to a few hundred feet upstream of Tully Road.
September 2012	5,760 cubic yards of sediment was removed from the east bank of Lower Silver Creek from Thompson Creek to Tully Road.
Summer 2013	13,990 cubic yards of sediment was removed from the middle of Lower Silver Creek at its confluence point with Norwood Creek.

For the Flint/Ruby Creek system, only 10 cubic yards of sediment has been removed in 2007 at the location where Flint Creek enters the park and is joined by Ruby Creek.

Other maintenance activities have consisted of removal of fallen tree/debris from Lower Silver, Flint, and Ruby Creeks and maintaining the culvert entry points into LCRP of Flint, Ruby and Lower Silver Creek free of debris.

6.2 Stream Maintenance Program/Ongoing Maintenance Program

The creeks within LCRP fall under the District's Stream Maintenance Program (SMP) which provides a framework that balances maintenance of the District's waterways with anticipated impacts on the environment. This balanced approach enables the District to fulfill its mission within the SMP's environmental parameters. The SMP is a long-term and ongoing District program to improve the management and maintenance of flood control channels and streams under the District's authority. The SMP establishes programmatic guidance for the District's routine facility maintenance activities to facilitate avoidance and minimization of environmental

impacts. The SMP also provides the organizational framework to oversee routine maintenance activities, keeping the program compliant with the terms and conditions of its permits.

It is presumed that all maintenance described in this chapter will follow parameters outlined in the District's County Wide Stream Maintenance Program 2 (SMP2) which provides environmental coverage for conducting routine maintenance for streams in Santa Clara County. SMP2 includes maintenance activities such as; sediment removal, erosion protection, large woody debris management, vegetation management and minor activities associated with existing infrastructure (i.e. graffiti removal, fence repair etc.)

6.3 Staff-Recommended Alternative Maintenance Activities

The following maintenance activities would be required by the staff-recommended alternative.

Levee: Raising the levees would require continued monitoring and inspection of the levee top and side-slopes for subsidence, erosion, and rodent damage; repair would be required as needed. A maintenance road would be provided on the top of raised levee; along Capitol Expressway and Cunningham Avenue at no less than 10 feet however, the existing 15 ft wide lower maintenance road will be the primary maintenance road. Vegetation management would continue along the top and side slopes of the levees as allowed by SMP2.

Floodwall: Floodwalls would require visual monitoring for cracks, spalls and other types of damage; repair would be required as needed. As indicated by the District's maintenance staff, the maintenance activities will be performed from the park side, therefore, there is no need for an additional maintenance access. Vegetation management would be to control weeds adjacent to the wall. Per the existing 1978 Agreement, City is currently responsible for debris and graffiti removal.

Creek Sediment Maintenance: SMP2 allows for sediment removal within Lower Silver, Flint, and Ruby Creeks. Necessary occurrence of sediment removal would be more clearly identified by the District's Hydrology, Hydraulic, & Geomorphology Unit 296 through a separate effort.

Creek Vegetation Maintenance: SMP2 allows for large woody debris management and vegetation management. Necessary occurrence of vegetation removal would be more clearly identified by the District's Hydrology, Hydraulic, & Geomorphology Unit 296 through a separate effort.

6.4 Long-Term Infrastructure Maintenance

New maintenance activity would be to maintain the levees and floodwalls to comply with FEMA accreditation requirements. Other maintenance activities would be more clearly identified by the District's Hydrology, Hydraulic, & Geomorphology Unit 296 through a separate effort; however for the purposes of this estimate, costs have been based on past maintenance activities.

6.5 Staff-Recommended Alternative Maintenance Cost

The estimated annual and life time maintenance cost for the staff-recommended alternative is itemized and summarized below in the Table 6-1. Costs were based on a 50-year design life and were escalated using a 3% compounding interest rate. The following activities were identified:

- Mowing and weed control (levees and floodwalls)
- Sediment monitoring in the creek
- Graffiti removal (floodwalls)
- Debris/fallen trees removal (in creeks)

Table 6-1. Maintenance Cost

Activity	Annual Cost (in 2015 value)	Life Time Cost (50 yrs)
Vegetation Control	$3,100	$336,474
Sediment Removal**	$6,000	$651,240
Fallen Tree Removal	$8,000	$868,320
Debris/Graffiti Removal***		
Total Cost	**$17,100**	**$1,856,034**

* The total maintenance cost for the 50-year life of the project assumes a 3.0% compounding rate to account for escalation.
** Necessary occurrence of sediment removal will be identified by Hydrology, Hydraulic, & Geomorphology Unit 296 sediment analysis.
***This activity is currently conducted by the City per the 1978 Agreement however the future responsibility will be determined by a new revised 1978 agreement.

CHAPTER 7. PROJECT COST, FUNDING, AND SCHEDULE

7.1 Project Cost

The total 50-year lifetime cost for the staff-recommended alternative is $3.2 million in 2015 dollars. The detailed cost estimate can be found in Appendix E.

Construction: $3.2 million
50 -Yr Maintenance: $1.9 million
Total Lifetime Cost: $5.1 million

7.2. Project Funding

Funding for the staff-recommended alternative would be allocated partially from a California Department of Water Resources (DWR) Proposition 1E, Round 1 Stormwater Flood Management Grant 4600009640. The total grant of $25,000,000 would be used to sponsor the Lower Silver Creek Reaches 4 to 6 and Cunningham Flood Detention Facility Certification projects. The rest of the funding for this project would be from the District's Watershed and Stream Stewardship Fund 12.

7.3. Project Schedule

Design of the staff-recommended alternative is expected to begin in January 2016 and is anticipated to be completed by November 2016. Construction would be completed by December of 2018. The following are the major milestones:

- Begin Preliminary Design by October 2015
- Complete Draft CEQA Documents—Mitigated Negative Declaration by April 2016
- Draft MND Pubic Review by May 2016
- Board certifies MND by September 2016
- Submit Permits by September 2016
- Final PS&E by November 2016
- Board adopts PS&E and authorizes construction bidding by February 2017
- Final date permit is required (to begin construction in 2017) by April 2017
- Board reviews bid and awards construction contract by May 2017
- Construction begins by June 2017
- Construction ends by December 2018

CHAPTER 8. CONCLUSION AND RECOMMENDATIONS

It has been determined that the flood detention facility does have adequate flood storage capacity to meet all the project objectives except the objective of meeting FEMA freeboard requirements to be able to be FEMA certified. The flood detention facility only lacks adequate freeboard and, therefore, all that needs to be done is to either raise or add floodwalls to the creek levees along the periphery of the park to ensure they meet FEMA freeboard certification requirements.

Completion of both the Cunningham Flood Detention Facility and LSC Project improvements will provide 1-percent flood protection to more than 3,200 homes, businesses and schools in the Lower Silver Creek 1-percent floodplain near and north of LCRP.

The staff-recommended alternative meets all the project objectives and provides the most comprehensive and cost effective flood protection. The project team is, therefore, recommending the staff-recommended alternative be approved and design plans be prepared for construction of the project.

REFERENCES

1. Archaeological Constraints Report for Lake Cunningham Skate Park Project Initial Study, (Archaeological Resource Management), December 2005

2. City of San José, Lake Cunningham Park Master Plan Report – November 1976

3. City of San José, Lake Cunningham Park Master Plan Report Addendum – July 1978

4. City of San José, 1990 Lake Cunningham Park Master Plan Report – 1990

5. City of San José, Lake Cunningham Park Master Plan – 2006 Amendment Initial Study (September 2006)

6. Corrales, Joe T., Personal Communication, City of San Jose – Parks, Recreation & Neighborhood Services, June 2013

7. Coyote Creek Watershed Historical Ecology Study, Final Report, (San Francisco Estuary Institute), 2006

8. Cunningham Lake Regional Park Conceptual Trail and Bike Park Design, (International Mountain Bicycling Association – Trail Solutions Program), Summer 2012

9. Feasibility Report for Trail and Pathway Improvements, Lake Cunningham Regional Park, (Callander Associates Landscape Architecture, Inc.), October 2008

10. Federal Emergency Management Agency, Map Item ID 06085C0258H – Santa Clara County Unincorporated and Incorporated Area, May 2009

11. Geologic and Groundwater Information for the Cunningham Flood Detention Facility Planning Study, (District, Groundwater Monitoring and Analysis Unit), January 2013

12. Geotechnical Investigation, Lake Cunningham, (Woodward-Clyde Consultants), September 1978

13. Geotechnical Investigation, Cunningham Flood Detention Facility Existing Levee Evaluation, (Kleinfelder West, Inc.), May 2015

14. Hydraulic Operations Investigation for Lake Cunningham Park (George S, Nolte and Associates), September 1976

15. Lake Cunningham Regional Park Limnology and Water Quality Report (Questa Engineering Corporation), April 2010

16. Lake Cunningham Water Quality Investigation (URS Research Company), September 1976

17. Lower Silver Creek Improvement Project, Final Hydraulic Report, Coyote Watershed Program (Schaaf and Wheeler), March 2002

18. Lower Silver/Thompson Creeks Hydrology Study, Coyote Watershed Program (Nolte and Associates), November 2000

19. Preliminary Geotechnical Investigation, Lake Cunningham (Woodward-Clyde Consultants), September 1976

20. Sedimentation Study, Lake Cunningham (Woodward-Clyde Consultants), September 1976

21. URS, Draft Phase I Environmental Site Assessment Report – Lake Cunningham Regional Park, February 2006

22. URS, Draft Phase II Environmental Site Assessment Report – Lake Cunningham Regional Park, July 2006

23. 2014 – 2023 Stream Maintenance Program Manual, (District), July 2014

APPENDIX A

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AGENDA MEMORANDUM

AGENDA DATE 5/2/78 ITEM NO. 4 UNIT Design and Construction

ZONE E-1 PROJECT NO. 4026 NAME Lower Silver Creek - Lake Cunningham Park

SUBJECT: Agreement Between the City of San Jose and Santa Clara Valley Water District for Land Acquisition, Construction and Operation of Lake Cunningham Park

EXPLANATION:

This Agreement, between the City of San Jose and the Santa Clara Valley Water District, sets forth City and District responsibilities relative to land acquisition, construction and operation of Lake Cunningham Park. The park is located in the District's East Zone adjacent to Lower Silver Creek near Cunningham Avenue. In addition to its recreational uses, the park can function as a flood detention basin for storing peak flood flows on Lower Silver Creek and Flint Creek.

The City will acquire fee title to all park lands, including those now held by the District, and grant the District an easement to all park lands. The City will also be responsible for the design and administration of all construction projects for the park. The District will review and approve all construction plans and specifications.

The District's contribution for the construction of Lake Cunningham Park is estimated to be $2,356,700. This contribution is based on the cost of flood control facilities within the planned park area and on a reduction in capacity of Lower Silver Creek downstream of the planned park. This reduction is made possible by reservoir storage of flood waters within the park. The proposed contributions would be adjusted by the Engineering News Record Construction Cost Index at the time expenditures are made. The first phase of construction will be an interim grading project. This project, proposed to be funded by the District, is estimated to cost $1,843,600 and is tentatively scheduled for construction in late fall 1978. The interim grading will raise the level of flood protection downstream of Cunningham Avenue from a 30-year level to a 48-year level. The remainder of the District's contribution for the park would be made when the one percent flood protection measures to Lower Silver Creek and Thompson Creek are complete.

The District will be responsible for maintaining the flood control features of the stream channels within the park. The City will be responsible for maintaining the recreational-related features of the park, including repairs necessary as a result of inundation of park lands.

The City of San Jose has approved the Agreement.

RECOMMENDATION: That the Chairman be authorized to execute the Agreement.

AUTHORIZED

MAY - 2 1978

4-25-78
129

#A0358

AGREEMENT

BY AND BETWEEN CITY OF SAN JOSE
AND SANTA CLARA VALLEY WATER DISTRICT
REGARDING LAKE CUNNINGHAM PARK

CITY OF SAN JOSE, a municipal corporation of the State of California, hereinafter "City"; and

SANTA CLARA VALLEY WATER DISTRICT, a local public agency of the State of California, hereinafter "District";

AGREE this 2nd day of May, 1978, as follows:

RECITALS:

A. City plans the acquisition of property for and the creation of Lake Cunningham Park, hereinafter "the park".

B. The park development is planned for the area bounded by Cunningham Avenue, White Road, Tully Road and Capitol Expressway. In addition to containing recreational features and facilities, the park plan will include the following flood control features:

Provide a Lower Silver Creek Channel to 1% capacity.

Provide a Flint Creek Channel to 1% capacity.

Provide a Ruby Creek Channel to 1% capacity.

Construct channel flood flow control structures and weirs.

Provide a minimum of 380 acre-feet of flood storage capacity below elevation 125.0 feet.

Provide a minimum of 860 acre-feet of flood storage capacity below elevation 130.0 feet.

C. District, relying on implementation of said park plan by City and the consequent effect upon flood flows in the downstream channel of Lower Silver Creek, has reduced the planned size to which District will construct said channel.

D. The governing bodies of the contracting parties, having found it to be in the interest of their respective jurisdictions, intend by this agreement to provide for a just and appropriate division of responsibility in and about the creation and maintenance of the park and its functions of public recreation, open space, visual amenities and flood control benefits.

E. As an element of such division of responsibility, District will assist in the creation of said park by making a monetary contribution to the cost of the necessary construction work, which contribution will be based upon and limited to the cost of facilities within the planned park area and on Lower Silver Creek downstream thereof that, by reason of anticipated flood control benefits of park construction, will not have to be built. The cost of building said facilities is estimated by the parties to be Two Million Three Hundred Fifty-Six Thousand Seven Hundred Dollars ($2,356,700) (March 1978 Cost).

AGREEMENT:

1. In accordance with the California Environmental Quality Act, City is the lead agency with respect to the project, and District is a responsible agency with respect thereto. The rights and duties of the parties hereto depend upon prior full compliance with said Act.

2. (a) City will undertake and complete the acquisition of title to lands and rights of way (other than those held by District) necessary to the creation of the flood control features of the park plan. If such acquisition is not complete on or before September 1, 1978, this agreement shall be void altogether.

(b) Promptly upon completion of said acquisition, District will transfer to City the fee title of lands within the park now held by District. Simultaneously City will transfer to District an easement on lands of City in the park, the permitted uses of which shall be defined as follows:

> "Santa Clara Valley Water District ("District") may enter upon the described lands for maintenance and protection of the same to prevent erosion or other damage by flood or storm waters or to repair such damage or to prevent or correct a physical condition thereon threatening damage by flood or storm waters to lives or property and District may take all measures appropriate to such purposes; provided, that on no account may District perform any work of improvement or construction which is incompatible with a park use of said lands; further provided, that structural measures are permitted with the prior written approval of the Director of Public Works of the City of San Jose, which shall not unreasonably be withheld."

3. There is attached hereto, marked "Exhibit A" and made a part hereof, a schedule of flood control related construction work to be done showing such work to be in two stages, viz: Phase A and Phase B.

4. (a) Upon completion of property acquisition, District shall promptly pay to City One Hundred Thousand Dollars ($100,000)

and thereafter City will promptly prepare plans and specifications for the construction of the flood control related features listed under Phase A on Exhibit A hereto. District will have reasonable opportunity to review the same. Upon approval by District of the plans and specifications for the said flood control related features, City shall, in accordance with its lawful procedures, obtain all necessary permits and secure construction bids for the work. The parties intend that such construction shall begin prior to April 1, 1979. Within thirty (30) days following written notification to District that City has received bids and intends to award a construction contract for the work, District will promptly pay to City the sum of One Million Eight Hundred Forty-Three Thousand Six Hundred Dollars ($1,843,600), adjusted in accordance with the "Engineering News Record" Construction Cost Index (the March 1978 Construction Cost Index = 250.68 based on a 1967 base = 100), less the One Hundred Thousand Dollars ($100,000) previously paid for design purposes. During any period of deposit of such sum prior to its use in payment of the construction contract, interest earned by City thereon shall be credited to District.

If bids exceed said amounts, City may redesign and rebid the work to attempt to perform the work within said amounts provided that such redesign does not reduce the flood control benefits of the present design and master plan.

(b) At the time, now deemed to be not later than 1986, that District completes enlargement of Silver Creek downstream of the said park area, District will contribute to City in the manner stated in (a) above a sum representing the difference between said One Million Eight Hundred Forty-Three Thousand Six Hundred Dollars ($1,843,600) and the total sum of Two Million Three Hundred Fifty-Six Thousand Seven Hundred Dollars ($2,356,700) mentioned in Recital E above, and City will proceed to construct the work shown as Phase B in said Exhibit A; provided that said sum so to be contributed shall be subject to adjustment in accordance with the said Construction Cost Index.

5. Every review by District of City's plans and specifications for construction or reconstruction of features and facilities in the park shall be for the purposes of determining their effect upon the flood control function of the park and shall in no degree be for the purpose of judging or determining upon their suitability for safe and proper public recreational use.

6. City shall require its contractor or contractors on the contract or contracts for work done pursuant hereto to meet applicable equal employment opportunity standards and to take out, pay for and maintain during the construction period, public liability and property damage insurance in form and to limits of liability acceptable to City and District, insuring both parties and their respective officers and employees as named insureds from and against any and all loss or liability for damages, death or injury arising out of or in any way resulting from the construction.

2356 700
1843 600
F 13 100

7. It is understood that works in the park constructed for flood control purposes are designed to permit inundation in stages above a certain level of park lands by floodwaters from Lower Silver Creek and Flint Creek, and City shall not hold District responsible for such planned inundation or for a damaging result, if any, to City property or personal injury to City officers or employees caused by such inundation, the configuration of areas of the park beyond the lake itself being intended as providing a basin for the temporary storage of flood flows.

8. District will be responsible for maintenance for flood control uses of the channel of streams within the park and of flood control structures of and appurtenant to such streams. City will be responsible for maintenance for recreational uses of the park lands, and all structures and facilities therein and such responsibility of City shall include maintenance in a safe, sightly and sanitary condition of the channel of streams and structures in and appurtenant thereto for the purpose of recreational uses thereof, excluding, as aforesaid, maintenance of such channels and structures for the purpose of flood control uses thereof.

9. City shall have and exercise complete control of recreational and public visitor uses of the park including the care of public safety and sanitation, and City shall indemnify, defend and save harmless District, its officers and employees from loss or liability for every damage, death or injury or claim thereof arising from or howsoever occasioned by City's use of said park lands and facilities including public visitor uses thereof or from public use of adjacent premises of District occurring in consequence of City's use of said park lands, and/or by City's exercise or failure to exercise its maintenance and/or supervision responsibility hereunder. District shall indemnify, defend and save harmless City, its officers and employees from loss or liability for every damage, death or injury or claim thereof occasioned by District's entry upon said park lands and its exercise or failure to exercise its maintenance responsibility hereunder, whether or not District's fault is joint, concurrent, or successive with fault by other parties.

10. City will, at its cost, repair damage to District works in the park caused by City, its employees, agents or contractors or by public use. District will, at its cost, repair damage to City's park property caused by District, its employees, agents or contractors.

WITNESS THE EXECUTION HEREOF the day and year first hereinabove set forth.

CITY OF SAN JOSE, a municipal corporation of the State of California

By: J. G. Hayes
Mayor

"City"

SANTA CLARA VALLEY WATER DISTRICT, a local public agency of the State of California

By: Maurice E. Brubeck
Chairman, Board of Directors

"District"

ATTEST:

FRANCIS L. GREINER

By Deputy

City Clerk

ATTEST: VIOLET V. ENANDER

Clerk of the Board of Directors

APPROVED AS TO FORM:

City Attorney

Address: 801 N. First Street
San Jose, CA 95110

Phone: (408) 277-4000

APPROVED AS TO FORM:

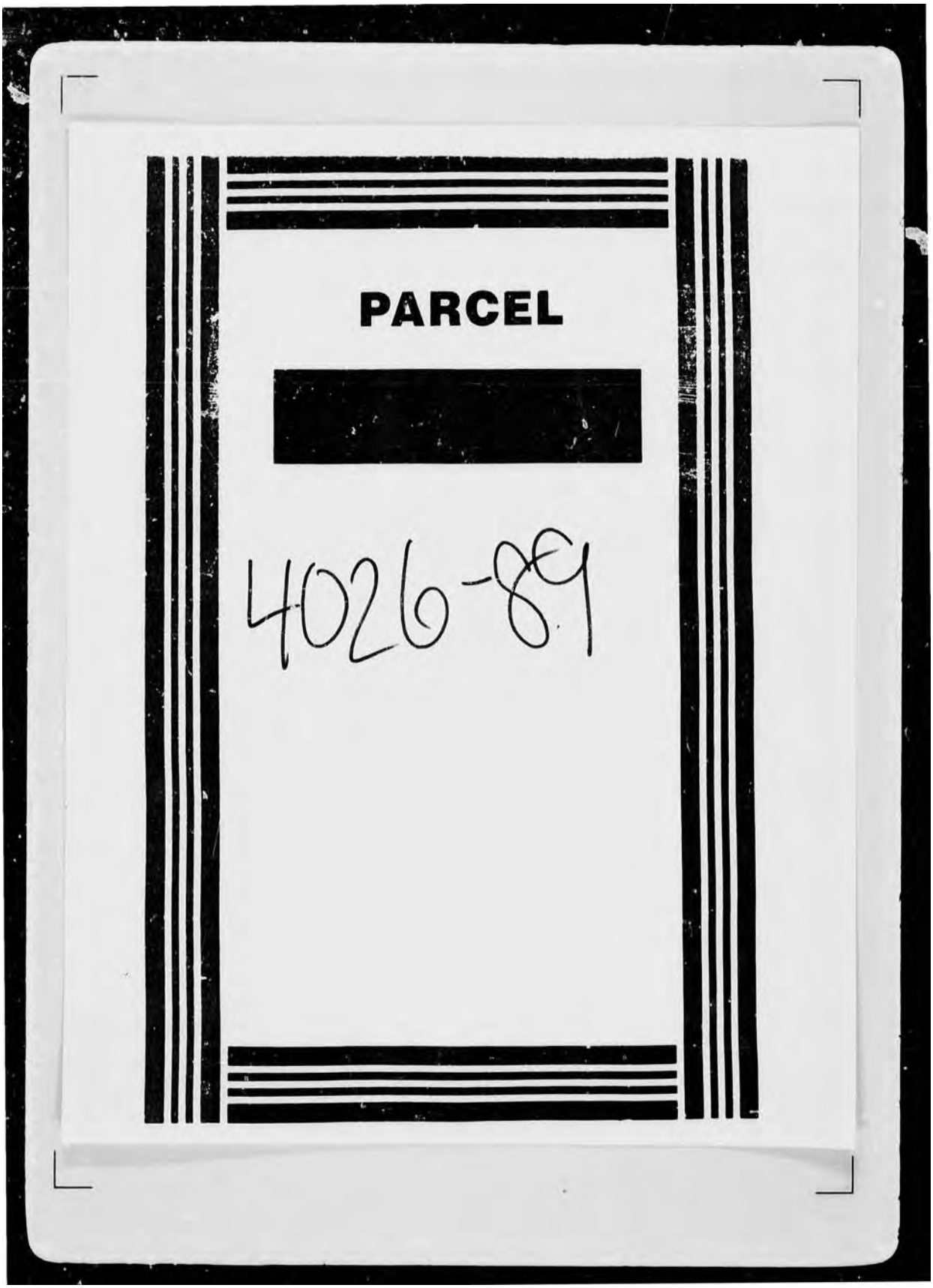
General Counsel

Address: 5750 Almaden Expressway
San Jose, CA 95118

Phone: (408) 265-2600

EXHIBIT A

Flood Control Related Features	March 1978 Cost: Construction Cost and 10% Contingencies	Engineering, Inspection, Etc. @ 25%	Total
Phase A, First Stage Grading Project			
1. Grade lake and meadow area to 121' and 120' elevations, respectively.	$ 982,400	$ 245,600	$1,228,000
2. Excavate Ruby & Flint Creeks.	114,800	28,700	143,500
3. Structural channel improvements on Ruby & Flint Creeks.	61,700	15,400	77,100
4. Hydroseed excavated areas.	53,200	13,300	66,500
5. Ruby & Flint Creeks control structure.	28,200	7,000	35,200
6. Lower Silver Creek channel excavate.	247,400	61,900	309,300
7. Less Soils investigation contract.		- 16,000	- 16,000
Subtotal	$1,487,700	$ 355,900	$1,843,600
Phase B, Second Stage Project			
1. Lower Silver Creek			
a. Structural channel improvements	$ 215,100	$ 53,800	$ 268,900
b. Control structure	44,300	11,100	55,400
2. Ruby Creek (through Meyer's property)			
a. Excavation	7,800	2,000	9,800
b. 84-inch RCP	67,200	16,800	84,000
3. Lower Silver Creek weir	42,100	10,500	52,600
4. Ruby/Flint Creek weir	11,100	2,800	13,900
5. Outlet control structure	22,800	5,700	28,500
Subtotal	$ 410,400	$ 102,700	$ 513,100
TOTAL	$1,898,100	$ 458,600	$2,356,700


PARCEL
4026-89

PARCEL RECORD

Project:	Agent:	Parcel No.:
Lower Silver Creek	J. Simons	4026-89

Grantor/Grantee: City of San Jose

Street Address:

City, State, Zip Code:

Telephone:

A.P.N. No.: 491-01-

ACREAGE

Fee

Existing Easement 204 058

Future R/W

TYPE OF TRANSACTION

X-File 4026-7.01 etc.

Regular ☐
Miscellaneous ☑
Deed Out ☐

Ordinance ☐

Appraiser
Title Company
Escrow No.
Date Signed 9-4-80 mv
Reconveyance/Consent Requested
Reconveyance/Consent Received
Tax Proration/Requested
Tax Proration/Received
Resolution/Agenda Approval 9-16-80 mv
Escrow Instr. Sent
Recorded 10-16-80
Tax Cancellation Requested N/A
Tax Cancellation Received (No.)
Policy Title Ins. in File N/A
Title Co. Bill Approved
Assessor Advised (Deed Out) ?

Date Signed
Reconveyance Requested
Reconveyance Received
Resolution/Agenda Approval
Recorded
Engineer Notified
Tax Proration/Requested
Tax Proration/Received
R/W Req. Met Letter
Tax Cancellation Requested
Tax Cancellation Received

EMINENT DOMAIN

Resolution No.: Date: Case Filed: No.:

Served Summons: Served O.I.P.: Effective O.I.P. Date:

File to Counsel: Appraiser: Trial:

Settled by Agreement: Settlement/Award: Final Order Recorded:

R-W Transcript 1-27-81 SSC

Plats Distributed " "

Posted 2-24 mv

File Closed 2-24-81 mv

DEFERRED PAYMENT

Approx. Payment Date Amount

Completion Certified Payment Made

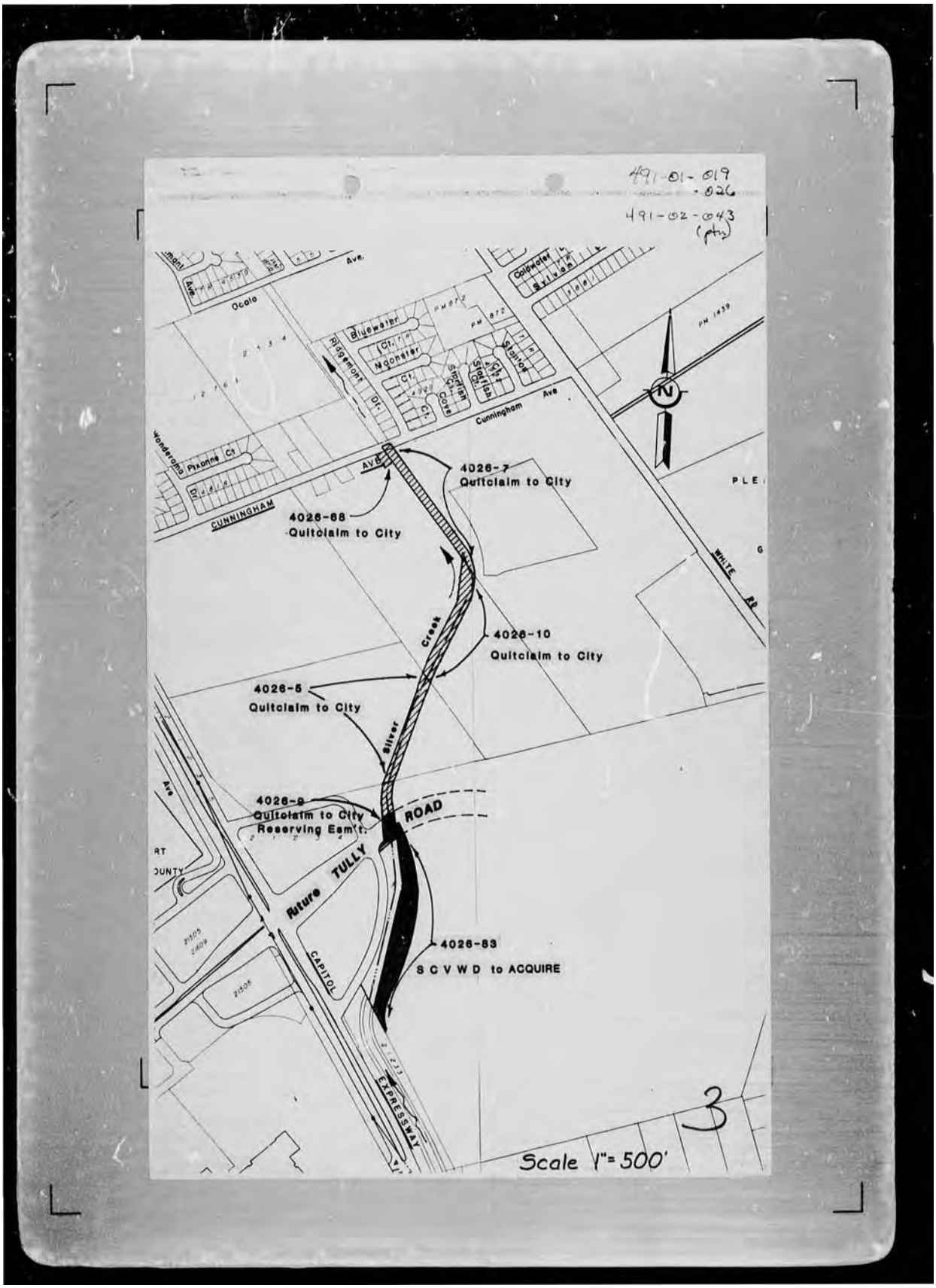
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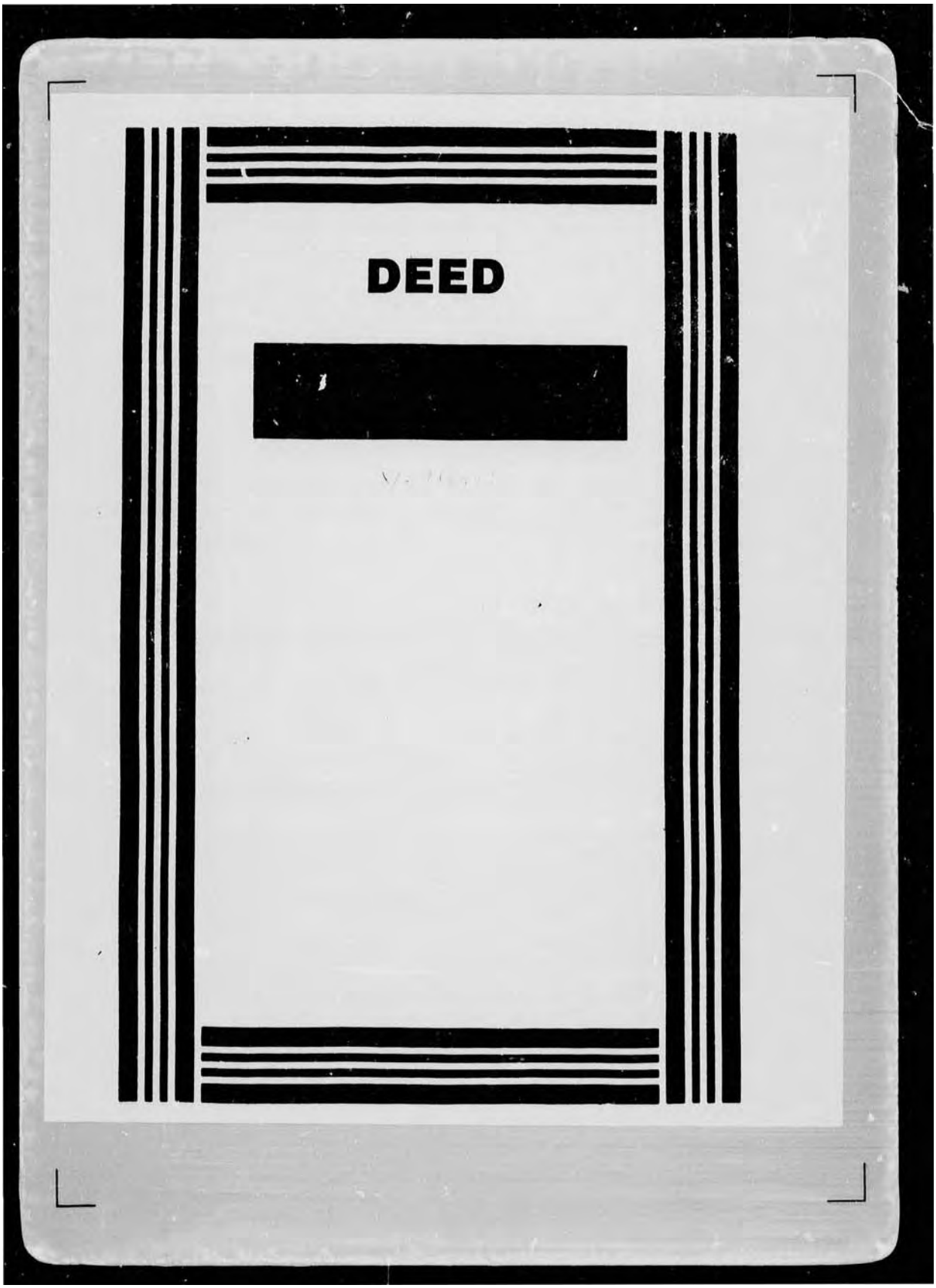
7

4/20/17

MAPS


COUNTY, CALIFORNIA
BOOK 491
PAGE INDEX
BK 488
BK 649
BK 673
BK 654
Project: 4026-89
From: City of San Jose.
Book: F661 Pg. 254
#687456 Oct. 16, 1980
Easement
APN: 491-01-02
All Lots Cunningham
2


491-01-019
-026
491-02-043
(ptn)
Ocoio
Bluewater
Ct.
Ngonster
Ct.
Riflegreen
Dr.
Cunningham Ave
Wonderama
Pixonne Ct
CUNNINGHAM
4026-7
Quitclaim to City
4026-68
Quitclaim to City
4026-10
Quitclaim to City
4026-5
Quitclaim to City
Silver
Creek
4026-9
Quitclaim to City
Reserving Eas't.
ROAD
TULLY
Ritura
CAPITOL
4026-83
S C V W D to ACQUIRE
EXPRESSWAY
WHITE RD
3
Scale 1"= 500'


DEED

When Recorded Return To:
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118

F 661 PAGE 254 6871456

FILED FOR RECORD AT REQUEST OF
Santa Clara Valley Water Dist
Oct 16 2 38 PM '80

OFFICIAL RECORDS
SANTA CLARA COUNTY
GEORGE A MAHN
RECORDER

GRANT OF EASEMENT

CITY OF SAN JOSE, a municipal corporation, GRANTOR,

does hereby GRANT to

SANTA CLARA VALLEY WATER DISTRICT, a public corporation, GRANTEE,

F 661 PAGE 254

a non-exclusive easement to enter upon real property owned by Grantor and situate in the City of San Jose, County of Santa Clara, State of California, for maintenance and protection of the same to prevent erosion or other damage by flood or storm waters, or to repair such damage or to prevent or correct a physical condition thereon threatening damage by flood or storm waters to lives or property, and Grantee may take all measures appropriate to such purposes; provided, that on no account may District perform any work of improvement or construction which is incompatible with a park use of said lands; further provided, that structural measures are permitted with the prior written approval of the Director of Public Works of the City of San Jose, which shall not unreasonably be withheld; said real property being described as follows:

All that certain real property, situate in the City of San Jose, County of Santa Clara, State of California, being a portion of the Pala Rancho, more particularly described as follows:

COMMENCING at the most northwesterly corner of Parcel "D", as said parcel is shown on the Record of Survey recorded in Book 258 of Maps, at page 13, Santa Clara County Records, said corner being a point on a line that is parallel with and 67.00 feet northeasterly measured at right angles from the center line of Capitol Expressway, shown on said map as MEDIAN CENTERLINE, FUTURE CAPITOL EXPRESSWAY;

thence along said parallel line N 29° 20' 00" W, 22.76 feet to the TRUE POINT OF BEGINNING;

thence continuing along said parallel line N 29° 20' 00" W, 1,670.57 feet;

thence N 27° 02' 30" W, 100.16 feet to a point in a line that is parallel with and 71.00 feet northeasterly measured at right angles, from the centerline of Capitol Expressway, shown as centerline Future Capitol Expressway on the Record of Survey recorded in Book 258 of Maps, at page 14, Santa Clara County Records;

thence along said parallel line N 29° 20' 00" W, 120.00 feet;

thence along a tangent curve to the right having a radius of 40.00 feet, through a central angle of 97° 32' 00", an arc length of 68.09 feet, to a point in a line that is parallel with and 30.00 feet southeasterly measured at right angles from the centerline of Cunningham Avenue, as said Avenue is shown on said last mentioned map;

thence along said parallel line, N 68° 12' 00" E, 3,407.73 feet;

thence along a tangent curve to the right having a radius of 24.00 feet, through a central angle of 75° 54' 13", an arc length of 31.79 feet to a point in a line that is parallel with and 90.00 feet southwesterly measured at right angles, from the centerline of White Road, as said road is shown on the "Map of the Subdivision of the Fillmore Tract", recorded in Book "C" of Maps, at page 57, Santa Clara County Records;

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-1-

thence along said parallel line S 35° 53' 47" E, 2,245.39 feet;

thence along a tangent curve to the right, having a radius of 1,710.00 feet, through a central angle of 07° 44' 09", an arc length of 230.88 feet to a point of compound curvature;

thence along a tangent curve to the right, having a radius of 50.00 feet, through a central angle of 102° 15' 03", an arc length of 89.23 feet to a point of reverse curvature;

thence along a tangent curve to the left, having a radius of 1,065.00 feet, through a central angle of 29° 04' 44", an arc length of 540.51 feet;

thence S 45° 00' 41" W, 476.16 feet;

thence along a tangent curve to the right, having a radius of 935.00 feet, through a central angle of 64° 09' 44", an arc length of 1,047.05 feet to a point of reverse curvature;

thence along a tangent curve to the left, having a radius of 1,065.00 feet, through a central angle of 53° 14' 45", an arc length of 989.72 feet to a point of reverse curvature;

thence along a tangent curve to the right, having a radius of 40.00 feet, through a central angle of 97° 05' 2[illegible]", an arc length of 67.78 feet;

thence N 26° 58' 55" W, 136.72 feet;

thence along a tangent curve to the left, having a radius of 160.00 feet, through a central angle of 76° 43' 00", an arc length of 214.23 feet to a point in the northerly line of said Parcel "D";

thence along said northerly line, S 76° 18' 05" W (S 76' 17" W per map), 671.17 feet;

thence along a tangent curve to the right, having a radius of 30.00 feet, through a central angle of 74° 21' 55", an arc length of 38.94 feet to the TRUE POINT OF BEGINNING.

Containing 204.058 acres, more or less.

DATED: September 4, 1980

CITY OF SAN JOSE, a municipal corporation,

By Janet Gray Hayes
Janet Gray Hayes, Mayor

"Grantor"

APPROVED AS TO FORM:

William W. Burns
WILLIAM W. BURNS
Senior Deputy City Attorney

ATTEST:

Helen E. Jackson
Helen E. Jackson, City Clerk

APPROVED AS TO FORM:

Albert Thomas Henley
ALBERT THOMAS HENLEY
General Counsel
Santa Clara Valley Water District

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(Mayor's Acknowledgment) F 661 PAGE 256

STATE OF CALIFORNIA)
COUNTY OF SANTA CLARA) ss

On September 4, 1980, before me, the undersigned, a Notary Public in and for the above said County and State, personally appeared _____ Janet Gray Hayes, known to me to be the Mayor, of the municipal corporation described in and that executed the within instrument, and also known to me to be the person who executed the within instrument on behalf of the corporation therein named, and acknowledged to me that such corporation executed the same.

Witness my hand and official seal the day and year first hereinabove written.

Wilma M Fabos
Notary Public in and for the County of Santa Clara, State of California

OFFICIAL SEAL
WILMA M. FABOS
NOTARY PUBLIC - CALIFORNIA
SANTA CLARA COUNTY
My comm. expires APR 25, 1981

CERTIFICATE OF CONSENT AND ACCEPTANCE

This is to certify that the interest in real property conveyed by the attached deed or grant to Santa Clara Valley Water District is hereby accepted by the undersigned duly authorized agent on behalf of the Board of Directors of said Santa Clara Valley Water District, pursuant to authority conferred by Resolution No. 68-25 of said Board of Directors adopted on the 26th day of March 1968, recorded March 27, 1968 in Book 8069, Page 535, Official Records of Santa Clara County, California, and the grantee consents to recordation thereof by its said duly authorized agent.

DATED: SEP 16 1980, 19___.

SANTA CLARA VALLEY WATER DISTRICT

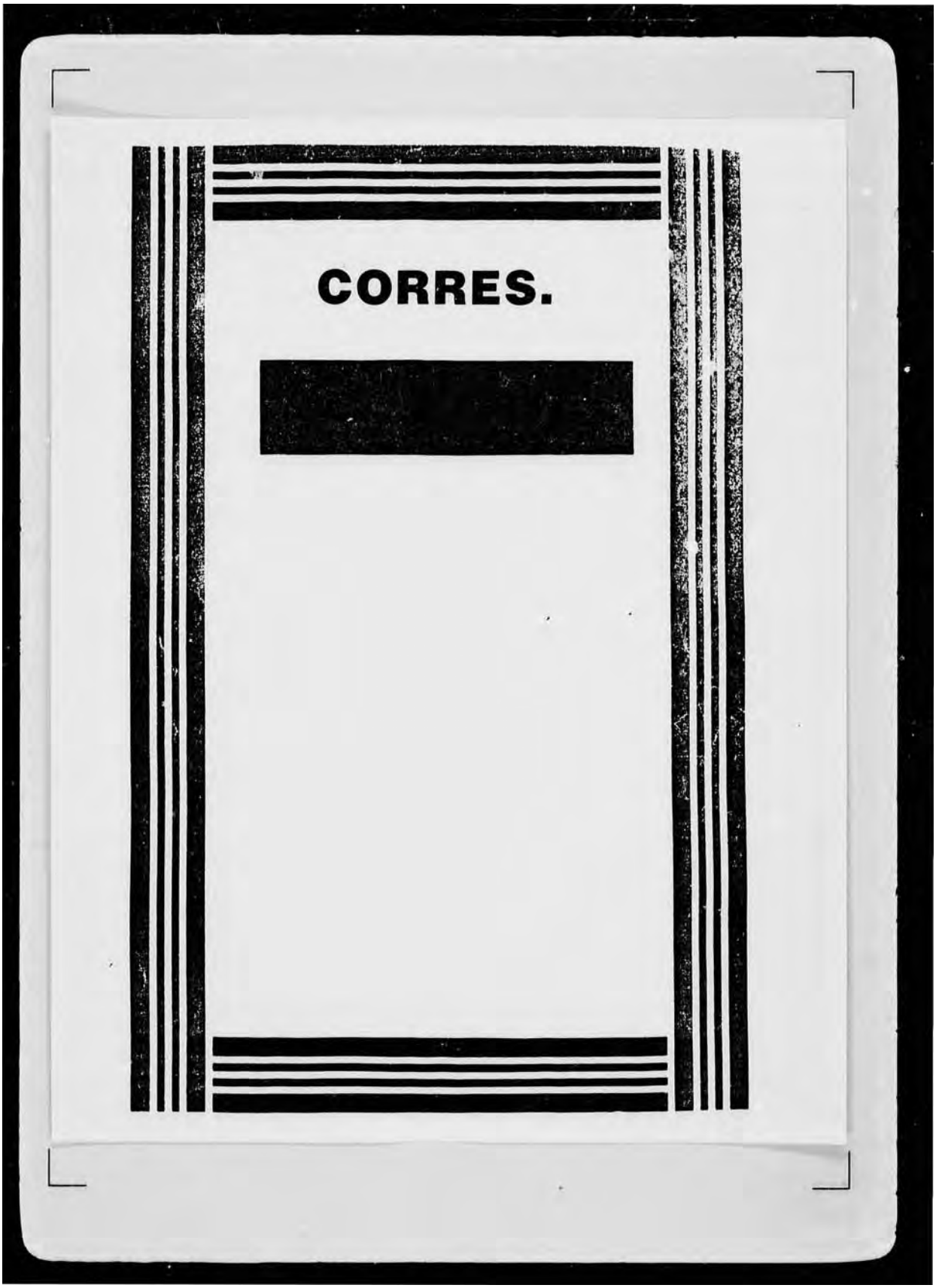
By Doris Maronek
~~General Manager~~/Clerk of the Board of Directors
(Strike out inapplicable one) CLERK PRO TEM OF THE BOARD OF DIRECTORS

6

CITY ATTORNEY
CITY OF SAN JOSE

REC. JUN 30 1980

From _____ To _____


CORRES.

J. Simons

Santa Clara Valley Water District

ALBERT THOMAS HENLEY
GENERAL COUNSEL

5750 ALMADEN EXPRESSWAY
SAN JOSE, CALIFORNIA 95118
TELEPHONE (408) 265-2600

June 19, 1980

William W. Burns, Esq.
Office of the City Attorney
City of San Jose
151 West Mission Street
San Jose, California 95110

Dear Mr. Burns:

I have received for review a proposed form of grant of easement, City of San Jose to SCVWD. It appears that the intention is to indicate the limits on permitted uses by recording, as an exhibit, the entire May 2, 1978 agreement pursuant to which the grant is to be made.

Con permiso, I have amended the last paragraph so that the form follows exactly the language of Section 2(b) of our agreement and meets the present duty of the City to grant.

In this way we can avoid the bulk and clumsiness of a recordation with an Exhibit A to which is attached another Exhibit A.

I appreciate your courtesy in this matter.

Faithfully,

Albert Henley -

Albert Thomas Henley
General Counsel

Enclosure

bc: J. Simons w/enclosure

ATH:scs

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Appendix B

Santa Clara Valley Water District

MEMORANDUM

FC 14 (01-02-07)

TO:	Cunningham Flood Detention Facility Planning Study, Project No. 40264011	FROM:	Hydrology, Hydraulics, & Geomorphology Unit 296
SUBJECT:	Hydraulic Criteria for Planning Study	**DATE**:	September 1, 2015

The District's Hydrology, Hydraulics, & Geomorphology Unit 296 is providing this memorandum to the Cunningham Flood Detention Facility Planning Study project files and for inclusion in the project's Planning Study Report.

Unit 296 supported the development of the planning study's technical hydraulic criteria and 1-dimensional unsteady hydraulic model for the Cunningham Flood Detention Facility. Technical memorandums documenting the methodologies, basis of topographic data, and pertinent input variables for the hydraulic criteria and hydraulic model have been prepared. The technical documents are listed below and are available from Unit 296 upon request.

The following summarizes the Cunningham Flood Detention Facility's existing baseline criteria that should be used in the planning study for its basis of determining the necessary flood control improvement measures to meet the project's objectives.

- The Lower Silver/Flint/Ruby Creeks combined 1-percent inflow into the park is 5,059 cfs.
- Cunningham flood detention facility flood water surface elevation during a 1-percent storm event is 132.75 feet NAVD88. This corresponds to a flood storage capacity of approximately 1,020 acre-feet and relates to a flow of approximately 2,243 cfs being diverted into the park.
- The Lower Silver Creek 1-percent design flow downstream of Cunningham Avenue is 2,816 cfs.
- Freeboard for flood protection measures will be based on a creek water surface elevation of 133.1feet NAVD88.

Reference technical documents:

1. Jack Xu, Lower Silver Creek in Lake Cunningham Regional Park – Hydraulic Model (Revision #1), SCVWD, August 3, 2015.
2. Emily Zedler, Lower Silver Creek – Downstream Boundary Condition at Cunningham Avenue Bridge, SCVWD, August 8, 2014.

3. Robert Chan, Lake Cunningham and Lower Silver Creek – Flood Water Surface Elevation, SCVWD, July, 23, 2015.
4. Robert Chan & Emily Zedler, Lower Silver Creek – Hydraulic Model Extension Downstream of the Park, SCVWD, November 12, 2014. Updated August 4, 2015.

APPENDIX C

SANTA CLARA VALLEY WATER DISTRICT

Conceptual Alternatives Summary
Cunningham Flood Detention Facility Planning Study
Certification Project

Project No. 40264011

Report Prepared by:

Watersheds Design and Construction Division

Rechelle Blank, P.E.
Engineering Unit Manager

DECEMBER 2014

CONCEPTUAL ALTERNATIVES

The following provides a high level summary of the five conceptual alternatives.

1.1 Conceptual Alternative 1: Modify Periphery Creek Levees

This alternative would only modify the creek levees along the periphery of the park to provide the necessary freeboard. Lower Silver Creek's levee adjacent to Capital Expressway and Cunningham Avenue would be raised by up to 3 feet. A floodwall from 1.5 to 3 feet high would be added to Flint/Ruby Creek's berm adjacent to Cunningham Avenue and White Road. The floodwall would be constructed from the Cunningham Avenue Bridge up to the park's White Road entrance. No other improvements would be required. These improvements would provide the flood detention facility with adequate freeboard to meet FEMA certification requirements.

The flood detention facility would function as intended during a 100-year flood event. Floodwater would overspill into the park, Big Meadow and lake, 2,234 cfs would be diverted into the park, the floodwater surface elevation in the park would be 132.75 feet NAVD88, and 2,825 cfs would be released into Lower Silver Creek downstream of Cunningham Avenue. Lower Silver Creek's channel design can safely convey 2,825 cfs with adequate freeboard to meet FEMA certification requirements.

A conceptual map for this alternative is shown in Figure 1.1.

Advantages:

- No changes or impacts to Lower Silver and Flint/Ruby Creeks.
- No changes to the existing park recreational facilities and operation.

Disadvantages:

- City's garbage dumpster and pedestrian entrance located at the corner of Cunningham Avenue and White Road may need to be relocated.

- Overflow parking area may be a slightly reduced in size.

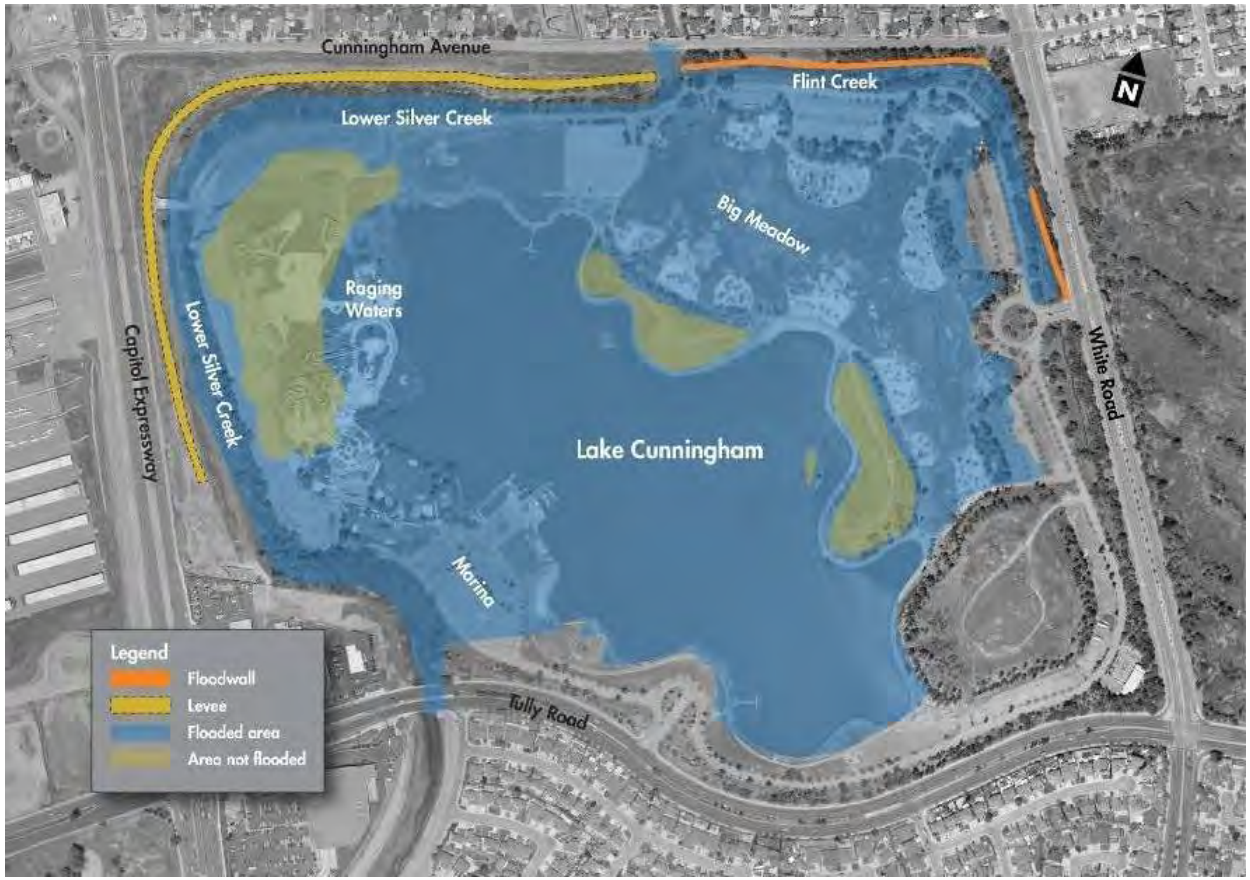


Figure 1.1 Conceptual Alternative 1: Modify Periphery Creek Levees

1.2 Conceptual Alternative 2: Isolate Detention Area to Lake

This alternative would use multiple weirs to divert flows into the park and isolate the floodwater in the park and lake area. Floodwalls would be constructed in the park to detain the floodwaters. A continuous floodwall, about 5 feet high, would be constructed along the interior park road edge from the Marina, Raging Water Theme Park, and both meadows. The floodwalls would function to separate the creek flows for the floodwater diverted into the park. To maintain accessibility, flood gates would be installed near the Marina, Raging Waters' turn-style entrance north of Raging Waters. This alternative would also require modification to the creek levees along the periphery of the park to provide the necessary freeboard as described in Conceptual Alternative 1.

During a 100-year flood event, floodwater would overspill into the park at the weirs. The isolated detention area would have a floodwater surface elevation of 131.5 feet NAVD88 and the flow released downstream Cunningham Avenue into Lower Silver Creek would be 2,750 cfs.

A conceptual map for this alternative is shown in Figure 1.2.

Advantages:

- No changes or impacts to Lower Silver and Flint/Ruby Creeks.
- Weirs and floodwalls would help improve operation of the flood detention facility.

Disadvantages:

- Five foot high floodwalls would significantly impact the park's visual aesthetics and open function.
- Floodwalls would be subject to graffiti.
- Isolating floodwater in the park and lake area will trigger a DSOD's jurisdictional change.
- City's garbage dumpster and pedestrian entrance located at the corner of Cunningham Avenue and White Road may need to be relocated.
- Overflow parking area may be a slightly reduced in size.



Figure 1.2 Conceptual Alternative 2: Isolate Detention Area to Lake

1.3 Conceptual Alternative 3: Box Culvert Bypass underneath Parking Lot

This alternative would bypass some of the floodwater into three 20-foot wide by 3-foot high box culverts underneath Raging Waters' parking lot. The box culverts would connect to Lower Silver Creek at the southern end of Raging Waters' parking lot, run northerly underneath the parking lot to just north of Raging Waters and connect back to Lower Silver Creek. This alternative would also require modification to the creek levees along the periphery of the park to provide the necessary freeboard as described in Conceptual Alternative 1.

During a 100-year flood event, floodwater would overspill into the park and some floodwater would be diverted into the box culverts. Flow released into Lower Silver Creek downstream of the park would be 2,810 cfs and the floodwater surface elevation in the park would be 132.75 feet NAVD88.

A conceptual map for this alternative is shown in Figure 1.3.

Advantages:

- No changes to the existing park recreational facilities and operation.

Disadvantages:

- Lower Silver Creek would be impacted where the box culverts connect with the creek.
- Box culverts and box culverts inlet and outlet points would be subject to high sedimentation.
- Sediment removal from the box culverts would be costly and difficult.
- City's garbage dumpster and pedestrian entrance located at the corner of Cunningham Avenue and White Road may need to be relocated.
- Overflow parking area may be a slightly reduced in size.

Figure 1.3 Conceptual Alternative 3: Box Culvert Bypass underneath Parking

1.4 Conceptual Alternative 4: Re-route Flow through Lake

This alternative would re-route some flow directly into and out of the lake via culverts constructed beneath the marina and the area located between the park's two meadows. A diversion structure would be constructed at Lower Silver Creek's bend near the marina to divert flow into a culvert that would run beneath the marina to the lake. Another diversion structure would be constructed at the lake's northern end near the west side of the Big Meadow to divert flow into a culvert that would run from the lake to Lower Silver Creek near its confluence point with Flint/Ruby Creek. This alternative would also require modification to the creek levees along the periphery of the park to provide the necessary freeboard as described in Conceptual Alternative 1.

During a 100-year flood event, floodwater would overspill into the park and some floodwater would be diverted into the culvert linked directly to the lake. Flow released into Lower Silver Creek downstream of the park would be 2,810 cfs and the floodwater surface elevation in the park would be 132.75 feet NAVD88.

A conceptual map for this alternative is shown in Figure 1.4.

Advantages:

- No changes to the existing park recreational facilities and operation.

Disadvantages:

- Lower Silver Creek would be impacted where the diversion structure and culvert connect with the creek.
- Culverts and culverts inlet and outlet points would be subject to high sedimentation.
- Sediment removal from the culverts would be costly and difficult.
- Direct sediment deposition would occur into the lake and increase the City’s lake maintenance cost.
- Water quality would be a concern for creek flow into the lake and for lake flow into the creek.
- City's garbage dumpster and pedestrian entrance located at the corner of Cunningham Avenue and White Road may need to be relocated.
- Overflow parking area may be a slightly reduced in size.

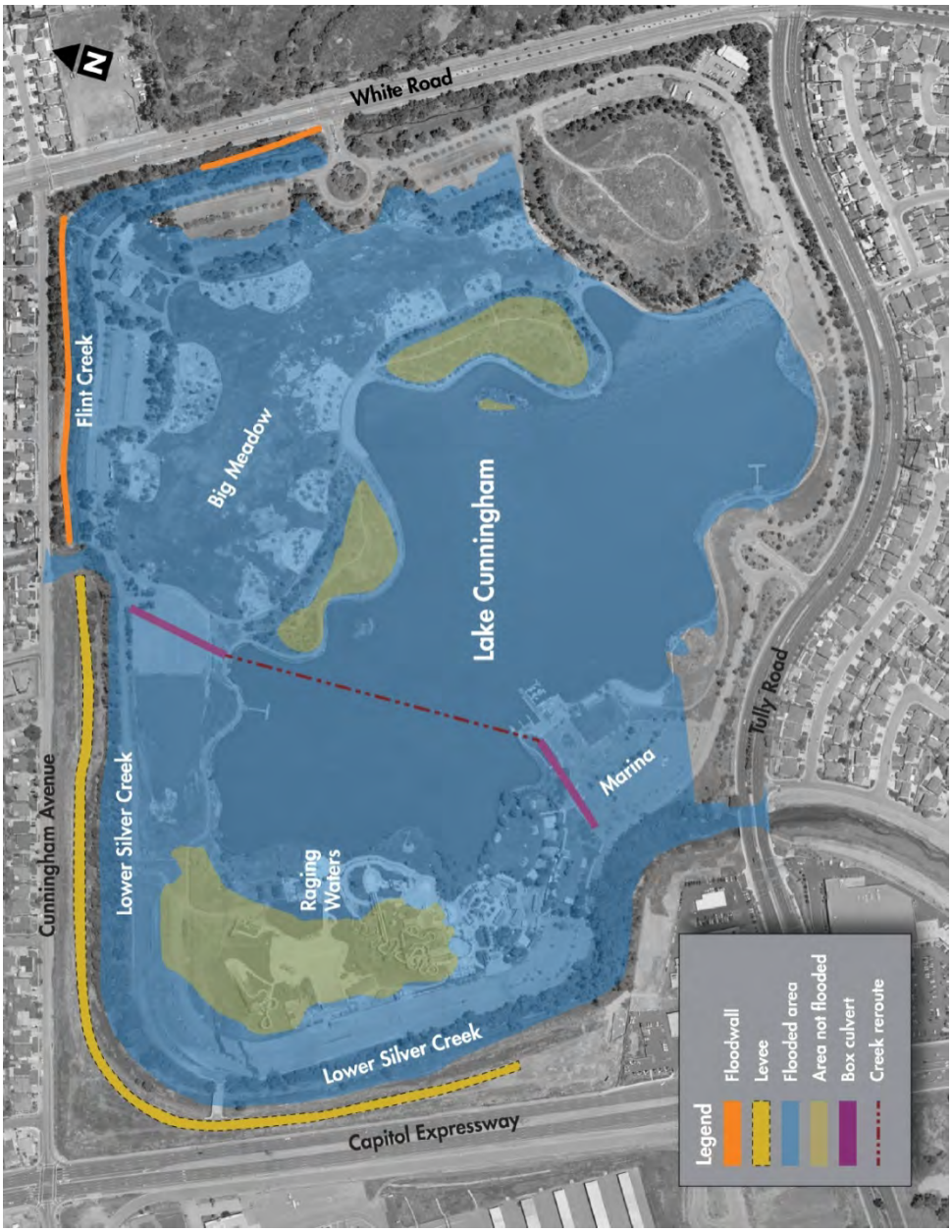


Figure 1.4 Conceptual Alternative 4: Re-route Flow through Lake

1.5 Conceptual Alternative 5: Widen Lower Silver Creek

This alternative would widen Lower Silver Creek's channel section in the park by as much as 30 feet. This would require Lower Silver Creek's levee located along the periphery of the park to be pushed out and relocated as close as possible to Capitol Expressway and Cunningham Avenue. The relocated levee would have a new interior and exterior slope embankment of 2:1 (horizontal: vertical) and the top of the levee would be narrowed to a minimum of 18 feet. The levee would also have to be raised by up to 3 feet and may impact and require relation of 3-high pressure PG&E gas lines. A floodwall up to 3 feet high would have to be added to Flint/Ruby Creek's berm adjacent to Cunningham Avenue and White Road.

During a 100-year flood event, the flood detention facility would function with floodwater overspilling into the park as intended. The flow released into Lower Silver Creek downstream of the park would be 2,810 cfs and the floodwater surface elevation in the park would be 132.75 feet NAVD88.

A conceptual map for this alternative is shown in Figure 1.5.

Advantages:

- No changes to the existing park recreational facilities and operation.

Disadvantages:

- Significant impacts would occur all along Lower Silver Creek.
- Levee modification may impact and require relocation of 3-high pressure PG&E gas lines.
- City's garbage dumpster and pedestrian entrance located at the corner of Cunningham Avenue and White Road may need to be relocated.
- Overflow parking area will be moderately reduced in size.

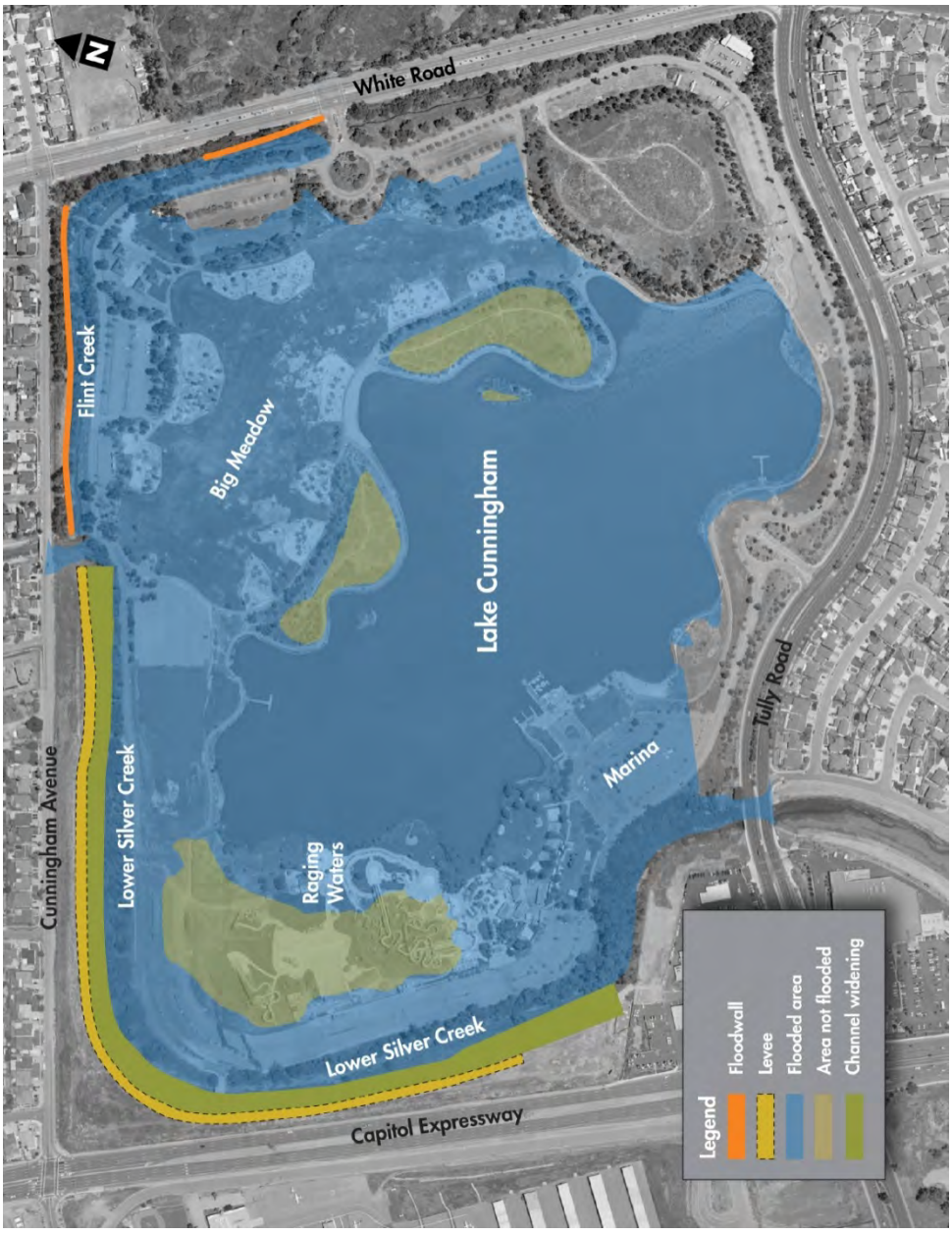


Figure 1.5 Conceptual Alternative 5: Widen Lower Silver Creek

1.6 No Project Alternative: No Capital Improvements

Under existing conditions, no improvements would be implemented in LCRP. And even though the flood detention facility does have adequate flood storage capacity to attenuate the peak flow to Lower Silver Creek downstream of Cunningham Avenue and Lower Silver Creek can safely convey its design flow, the facility does not have adequate freeboard to meet FEMA freeboard requirements. Therefore, the facility would not be able to be certified by FEMA and the flood insurance rate maps for the area near and north of LCRP would not be able to be revised.

APPENDIX D

Flood Detention Facility at Cunningham Park
Meeting Minutes for NFP Evaluation Meeting

Meeting Date: December 22, 2014
Meeting Location: HQ Rm A-212
Attendees: Jennifer Castillo, Environmental Services Manager
James Manitakos, Environmental Planner II
Zhen Shao, Associate Civil Engineer
Sarah Duckler, Sr Engineer
Rechelle Blank, Engineering Unit Manager
Afshin Rouhani, Engineering Unit Manager
Subject: Project NFP Evaluation Kick-off

The meeting was held to kick-off the Natural Flood Protection (NFP) evaluation process for the project per watershed QEMS work instruction guidance WW75125. This policy provides guidance to implement Board's Ends Policy E-3, specifically E-3.1.1 for an integrated and balanced approach to natural flood protection.

1. Zhen gave a power point presentation to the attendees to introduce the project background, objectives, and the 5 conceptual alternatives that have been developed for the project.

2. The attendees discussed the primary function of the site to function as a flood detention facility. It was determined that the project objectives should be narrowed to focus on validating the flood detention capacity of the site and determine what is required for the site to meet FEMA criteria only.

3. The attendees then examined the 5 conceptual alternatives. It was noted that in its existing condition, the site functions as intended and no additional improvements are required, therefore it was determined that there was only one practicable alternative – Conceptual Alternative 1. This alternative would modify the creek levees along the periphery of the park to provide the necessary freeboard to satisfy FEMA requirements.

4. The attendees suggested it would be best to revise the project's December 2013 Problem Definition Report to reflect the specific narrow objectives and identification of conceptual alternative 1 as the only practicable alternative. It was determined to document this determination in the Planning Study Report instead.

5. Based on this meeting, the project's objectives should be refined to better support the following key project goals:

- Validate the flood detention facility's capacity is as stipulated in the 1978 Joint Use Agreement between the City of San Jose and the District.

- Obtain FEMA certification of the flood detention facility and Lower Silver Creek improvements north of the Park to revise the applicable flood insurance rate maps in the Lower Silver Creek 1- percent floodplain near and north of the Park.

- Update the 1978 Joint Use Agreement between the City of San Jose and the District to meet the flood detention facility's validated condition.

APPENDIX E

CUNNINGHAM FLOOD DETENTION CERTIFICATION, #40264011

Cost Estimate Summary

Item	Unit Cost	Unit	Quantity	Amount
Site Preparation				
Clearing and Grubbing (incl. hauling)	$50,000	ACRE	4.0	$200,000
Vegetation demolition	$10,000	ACRE	0.2	$2,000
Floodwall Construction				
Excavation	$10	CY	1,750.0	$17,500
Backfill	$35	CY	1,750.0	$61,250
Base material (6" deep)	$11	SY	1,170.0	$12,870
Concrete	$1,350	CY	648.0	$874,800
Levee Construction				
Excavation	$10	CY	4,150.0	$41,500
Backfill	$35	CY	12,240.0	$428,400
Bridges Transition Wall				
Excavation	$10	CY	120.0	$1,200
Backfill	$35	CY	120.0	$4,200
Base material (6" deep)	$11	SY	80.0	$880
Concrete	$1,350	CY	45.0	$60,750
Traffic Control				
Traffic Control	100,000	LUMP	1	$100,000
Utility Relocation/Modification				
Storm Sewer Line Relocation	5,000	LUMP	1	$5,000
Miscellaneous				
Access/Dumpster Relocation	100,000	LUMP	1	$100,000
SUBTOTAL				$1,910,350
Mobilization (10%)				$191,035
Construction Contingencies (20%)				$420,277
TOTAL CONSTRUCTION				**$2,521662**
Inspection (15%)				$378,249
Mitigation				
Revegetation (VHP Fee)	300,000	LUMP	1	300,000
TOTAL COSTS				**$3,199,991**